

GROUNDWATER CLEANUP TASK FORCE

FINAL REPORT

December 1996

REPORT TO THE ARIZONA STATE LEGISLATURE OF THE GROUNDWATER CLEANUP TASK FORCE

December 23, 1996

INTRODUCTION

In 1996, the Arizona State Legislature enacted significant revisions to Arizona's counterpart to the federal Superfund program, known as the Water Quality Assurance Revolving Fund ("WQARF") program. The intent of that legislation, House Bill 2114 (Chapter 259, 1996 Laws), among other things, was to lay the groundwork for an even more comprehensive revision of the program aimed at achieving a "workable WQARF," *i.e.*, an efficient, equitable system for remediation of contaminated groundwater and contaminated sites impacting groundwater quality in the State. The Groundwater Cleanup Task Force has worked since March, 1996 examining various aspects of Arizona's cleanup programs as well as similar programs in other states and on the federal level. Its members have debated these issues in detail, and present this report as a summary of the Task Force's work and recommendations.

BACKGROUND

Sites within Arizona where historic soil and groundwater contamination may pose some risk to human health and the environment can be addressed either under the federal Superfund Act, the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), or its state counterpart, WQARF. The United States Environmental Protection Agency ("EPA") and the Arizona Department of Environmental Quality ("ADEQ") identify, assess, and seek remediation of these sites in accordance with state and federal regulations. Ten sites in Arizona are on the National Priorities List ("NPL") and, therefore, are addressed under the federal Superfund program. Currently, 28 sites are on the state WQARF Priority List; these sites are addressed using a combination of funds from WQARF and private responsible parties. ADEQ also oversees remediation at 19 other "non-priority" WQARF sites. Generally speaking, both EPA and ADEQ seek to compel private parties to conduct cleanups where possible, preserving public funds for "orphan" sites where no solvent parties remain.

Both CERCLA and WQARF establish a liability scheme that, when voluntary cleanups do not occur, prompts government and private party litigation and provides for an administrative enforcement program for remediating hazardous substance contamination. Under CERCLA and WQARF, EPA and ADEQ may either (a) spend government funds to remediate contaminated sites and, thereafter, seek reimbursement from responsible parties; or (b) administratively and judicially compel site investigation and/or remediation. Both EPA and ADEQ prefer to compel private parties to conduct cleanups where possible.

With some distinctions, both schemes hold parties liable: (a) who currently or previously owned or operated a contaminated site; (b) whose hazardous substances were disposed there (commonly called "generators"); or (c) who transported hazardous substances to the sites, if they also selected the sites for the disposal of the hazardous substances. Owner/operator liability under WQARF is narrower in scope than under CERCLA, which

can hold current owners liable even if they acquired property after the contamination occurred. Superfund liability has been held to be retroactive (it is imposed for acts that occurred before the law was enacted), and strict (it is imposed without regard to fault). Liability also has been held to be "joint and several," unless the defendant can demonstrate that its actions caused a harm divisible from the harm to the entire site. Thus, theoretically, one party found to be liable can be held responsible for 100% of the costs of cleanup at a multi-party site. The threat of joint liability has traditionally been used at federal Superfund sites and at WQARF sites to prompt settlement by the largest and most obviously liable parties, leaving them to seek contribution toward cleanup costs from other responsible parties. It is this aspect of CERCLA and WQARF liability, which shifts the burden of investigating and proving the liability of other parties from the State to the first-identified parties, that has drawn the most vocal criticism.

Once liable parties are identified (or not identified, in the case of orphan sites), cleanup of contaminated sites proceeds to a level protective of "public health and welfare and the environment." Neither CERCLA nor WQARF provide specific cleanup criteria in statute; rather, CERCLA requires that parties conduct a complex analysis of applicable or analogous cleanup criteria established by other environmental programs; most often in the case of groundwater, Maximum Contaminant Levels established under the federal Safe Drinking Water Act are adopted. Controversy over whether it is feasible or cost-effective to restore an aquifer to drinking water quality adds to the time and transaction costs for cleanups both under CERCLA and WQARF.

When Arizona's Superfund program was established in 1986, the Legislature expressed its intent to provide \$5 million in annual funding for WQARF from the general fund. Funding mechanisms and amounts have changed over time. Liability features are, basically, a funding mechanism; therefore, they are integrally related. The existing sources of WQARF funding include: annual appropriations from the general fund, water users' fees, cost recovery from responsible parties, pesticide registration fees, hazardous waste facility fees, groundwater withdrawal fees, industrial discharge permitting fees, and fertilizer licensing fees. WQARF monies are used for providing matching funds and meeting other obligations under CERCLA, identifying contamination, assessing the impact of contamination, remedial actions, water quality monitoring, emergency responses, compliance and enforcement activities, and those costs associated with administering the fund.

GROUNDWATER TASK FORCE

History

In September of 1994, ADEQ created the Cleanup Standards Policy Task Force in response to the business community's request for uniform standards applicable to voluntary cleanups. The efforts of the Cleanup Standards Policy Task Force resulted in passage by the Legislature of HB 2197 in 1995, codified at A.R.S. Sections 49-151 -- 152. HB 2197 directed ADEQ to establish risk-based standards for remediation of contaminated soil. Pursuant to that mandate, interim soil cleanup standards have been promulgated in Chapter 7 of Arizona Administrative Code Title 18. In the course of developing soil cleanup standards, a subcommittee of the Cleanup Standards Policy Task Force identified a need for further

focus on groundwater cleanup issues. In response, ADEQ and the Arizona Department of Water Resources ("ADWR") convened an initial meeting of stakeholders in groundwater cleanup issues in early 1996. The stakeholders provided recommendations for membership on the Groundwater Task Force.

Membership

The Groundwater Task Force is made up of individuals representing a broad cross-section of interested parties and experts. Membership of the Task Force can be divided into three categories: public stakeholders, private stakeholders, and technical experts. The public stakeholders include representatives from the cities of Bullhead City, Goodyear, Mesa, Phoenix, Scottsdale, Kingman, Tempe and Tucson, as well as ADEQ, ADWR, the Arizona Department of Health Services ("ADHS"), and the Office of the Arizona Attorney General. Three other water purveyors, Salt River Project, Paradise Valley Water Company, and the Roosevelt Irrigation District are also represented.

The private stakeholders include the Arizona Cotton Growers Association, the Arizona Mining Association, Arizona Petroleum Marketers, Arizona Public Service, Arizona Chamber of Commerce, Arizona Association of Industries, Motorola, Valley Partnership, and Van Waters & Rogers. The Audubon Society, Gateway Neighborhood, and Scottsdale Concerned Citizens are also represented.

The technical experts include consultants and academics from Arizona State University, Miller Brooks Environmental Inc., Basin & Range Hydrogeologists, Inc., the United States Conservation Service, Harding Lawson Associates, and the United States Air Force.

The co-chairs of the Task Force were selected by the members of the Task Force and not appointed by ADWR or ADEQ. The two co-chairs are environmental attorneys James Derouin of Steptoe & Johnson and Karen Peters of Squire, Sanders & Dempsey.

Goals

HB 2114 established the Joint Select Committee on WQARF, comprised of six legislators and ten members of the public. The Joint Select Committee is directed to conduct a broad examination of the WQARF program and make reform recommendations to the entire Legislature. Among the requirements of HB 2114, the Joint Select Committee must "[c]onsider the recommendations of the groundwater task force . . . concerning administrative and legislative improvements to groundwater remediation programs" HB 2114 Sec. (B)(6). Thus, development of recommendations has been a primary goal; other issues that the Task Force was created to address, such as appropriate cleanup standards for groundwater, were deferred.

The first meeting of the Task Force was on February 29, 1996. Early in the process, the Task Force decided on four goals: reform WQARF liability and remedy selection schemes; provide adequate, annual, guaranteed WQARF funding; remove barriers and

create incentives for the end use of remediated groundwater; and provide ADWR and ADEQ authority to abandon and/or replace wells facilitating cross-contamination.

These goals and the considerations of HB 2114 were addressed by creating seven subcommittees of the Task Force. The subcommittees were charged with accomplishing the various goals set by the Task Force and proposing recommendations to be made to the Joint Select Committee. The proposed recommendations of the subcommittees were considered by the entire Task Force according to the procedures adopted by the Task Force.

RECOMMENDATIONS OF THE GROUNDWATER TASK FORCE

The remainder of this report is dedicated to the recommendations of the Groundwater Task Force. The issues addressed by the subcommittees are summarized first, expressed in terms of the Joint Select Committee's areas of inquiry as set forth in HB 2114. The issues are followed by the summarized recommendations of the subcommittee that have been approved by the Task Force. The Concluding Resolution of the Task Force, which adopts in total the recommendations of six of the subcommittees, is attached as Appendix A. A summary of the specific recommendations is attached to this Report as Appendix B. The full text of each subcommittee's recommendations and other related materials are attached to this Report in Appendices C through I.

I. SITE PRIORITIZATION SUBCOMMITTEE

A. Issues Addressed

The Site Prioritization Subcommittee examined issues related to ranking of WQARF sites according to risks to human health and the environment, as well as the likelihood of WQARF sites being added and subtracted from the Priority List in the future. With respect to site ranking, the Subcommittee was tasked with reviewing the current model for the ADEQ WQARF Eligibility and Evaluation Form. The Subcommittee's recommendations are intended to assist the Joint Select Committee as it considers "identification of contaminated sites that present a serious risk to human health and the environment which can be effectively remediated using cost-effective and practicable remedial measures" and "review the potential costs associated with remediating the existing water quality assurance revolving fund sites" Chapter 259, Sections 14(C)(5) and 14(B)(1). In addition, a subgroup of the Site Prioritization Subcommittee provided oversight to Clean Sites West, Inc., the independent contractor retained pursuant to HB 2114 to assess currently-listed WQARF sites and consider the effects of potential changes to the liability scheme. Chapter 259, Section 19. The Clean Sites West Report was made available to the Joint Select Committee on November 1, 1996.

MEMORANDUM

December 23, 1996

TO: Representative Rusty Bowers and Senator Jim Buster, Co-chairs
Joint Select Committee on the Water Quality Assurance Revolving Fund

FROM: Karen Peters and Jim Derouin, Co-chairs
Groundwater Cleanup Task Force

RE: Final Report of the Groundwater Cleanup Task Force

As we reported to you on August 21 and December 5, 1996, the members of the Groundwater Cleanup Task Force have spent, literally, tens of thousands of hours since February 29 of this year considering the issues identified in House Bill 2114 with the intent of reporting to the Joint Select Committee as contemplated in that legislation. Those deliberations ended on November 7 with the consensus endorsement of the work product of the following Task Force Subcommittees:

- Site Prioritization
- Public Participation
- Remedy Selection
- End Use
- Well Design and Use and
- Funding.

The work of these Subcommittees represents some of the most far-reaching recommendations put forth in any state with respect to the reform of a state superfund program. With respect to the crucial liability issue, the Task Force was unable to reach a consensus and, therefore, endorsed no proposals; rather, the Task Force reported out two alternative liability proposals as well as the cost estimates prepared by ADEQ for each for purposes of further deliberation and consideration.

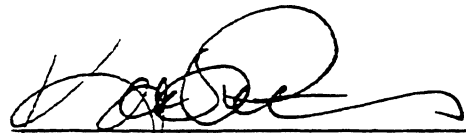
As Task Force co-chairs, we would like to extend our appreciation to the Task Force members who so diligently participated in this process; and, with the fore-knowledge that specific acknowledgments will not totally give credit to everyone to whom credit is due, we call particular attention to the efforts of the following institutions and individuals:

- the Salt River Project (represented by Greg Witherspoon), the Arizona Department of Water Resources (represented by Steve Olson and Mason Bolitho) and the City of Tempe (represented by Karen Gaylord) for hosting Task Force meetings.

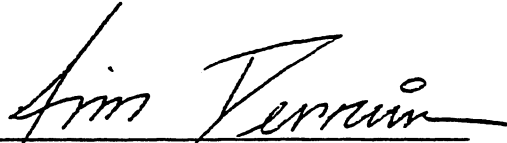
- the Arizona Department of Environmental Quality and the Office of the Attorney General which devoted, literally, thousands of hours of staff time to providing information to the Task Force.

We also extend our special appreciation to Henry Darwin, a University of Arizona hydrology graduate and a graduate of Northwestern School of Law of Lewis and Clark College, who provided, gratis, expert staff advice while waiting to be admitted to the practice of law in Arizona. It should be noted that Henry prepared the first draft of this report to the Joint Select Committee.

Finally, we extend to you our appreciation for the patience which you have demonstrated in allowing the Groundwater Cleanup Task Force to conclude its deliberations in a thorough and professional manner. The issues considered are complex and the answers to the problems presented are difficult and challenging. If they were easy, the Joint Select Committee would have resolved them long ago and the Groundwater Cleanup Task Force would never have been needed in the first place. As it is, we, with pride, present to you the attached work product of the Groundwater Cleanup Task Force on behalf of all of its members for your consideration.



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cc: Members, Joint Select Committee on the
Water Quality Assurance Revolving Fund
Rita Pearson, Director
Arizona Department of Water Resources
Russell Rhoades, Director
Arizona Department of Environmental Quality
Members, ADWR/ADEQ Groundwater Cleanup
Task Force

GROUNDWATER CLEANUP TASK FORCE REPORT TO THE ARIZONA STATE LEGISLATURE

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GROUNDWATER TASK FORCE MEMBERS

ORGANIZATION	REPRESENTATIVE
CO-CHAIRS	
Steptoe & Johnson	James Derouin
Squire, Sanders & Dempsey	Karen Peters
STATE AGENCIES	
Arizona Department of Environmental Quality	Ethel DeMarr - member Michele Robertson - alternate Kim MacEachern - member Chuck Graf - alternate
Arizona Department of Water Resources	Steve Olson - member Mason Bolitho - alternate
Arizona Department of Health Service	Will Humble - member Lee Bland - alternate
Attorney Generals Office	Pat Cunningham - member Edward Truman - alternate Tamara Huddleston - alternate
LOCAL GOVERNMENTS AND WATER PURVEYORS	
City of Bullhead City	Kathleen Tackett-Hicks - member Jim Smith - alternate
City of Goodyear	Steven P. Ruppenthal - member Jeff Trembly - alternate
City of Kingman	Louis G. Sorensen - member Pete Johnson - alternate
City of Mesa	Karl F. Kohlhoff - member Beth Miller - alternate
City of Phoenix	Karen O'Regan - member Donn Stoltzfus - alternate
City of Scottsdale	Barbara Goldberg - member Steve Bernit - alternate
City of Tempe	Karen S. Gaylord - member
City of Tucson	Karen Van Rijn - member Sandra E. Price - alternate
PV Water Company	Harold Thomas - member
Roosevelt Irrigation District	Stan Ashby - member Brent Welker - alternate

Salt River Project	Greg Witherspoon - member Kevin Wanttaja - alternate
PUBLIC INTEREST GROUPS	
Gateway Neighborhood	Terry Temnick - member Jim Lemmon - alternate Clyde Wheeler - alternate Velma Dunn - alternate
Scottsdale Concerned Citizens, Inc.	Hannah Goldstein - member Tena Dischler - alternate
Tucson Audobon Society Arizona Audobon Society	Peggy Wenrick - member Julia B. Gordon - alternate Sandy Bahr - replacement
TECHNICAL CONSULTANTS	
Basin & Range Hydrogeologists Inc.	Phil Lagas - member David Kirchner - alternate
Harding Lawson Associates	Bruce Travers - member John Kim - alternate
Miller Brooks Environmental Inc.	Harold Gill - member Phil Schneider - alternate
PRIVATE SECTOR	
AZ Cotton Growers Assn.	Rick C. Lavis - member Roger Hooper - alternate
AZ Mining Assn.	Duane Yantorno - member Kathy Arnold - alternate Robert F. Ressler - member Tom Conto - alternate Jay Spehar - subcom chair
AZ Petroleum Marketers	Jack Keller - member Andy Pala - alternate
AZ Public Service	Scott Davis - member John Boyer - alternate
Motorola	Tom Suriano - member Dennis Shirley - alternate
Valley Partnership	Doug Bartlett - member Andrew Stahl - alternate
Van Waters & Rogers	Brian Haney - member Michael Gaudette - alternate
AZ Chamber of Commerce	Dave Kimball - member Doug McAllister - alternate
AZ Association of Industries	Roger Ferland - member Dalva L. Moellenberg - alternate

ACADEMICS	
Arizona State University	Dr. Paul Johnson
U.S. Water Conservation	Dr. Herman Bouwer
FEDERAL AGENCIES	
Department of Defense	Ron McRobbie - member Charles Lee - alternate Karen Oden -alternate
STAFF SUPPORT	
ADEQ	Michele Robertson
ADEQ	Dr. Wayne Aerni
ADEQ	Susan Bentley-Johnston
ADWR	Mason Bolitho

B. Recommendations

The Site Prioritization Subcommittee established a subcommittee on Future Sites to evaluate whether there will be additional WQARF sites beyond those 28 currently listed on the WQARF Priority List. After considerable examination, the sub-subcommittee concluded, and the Task Force agreed, that there will be future WQARF sites, and that short- and long-term WQARF funding needs to be sufficient to account for investigation, evaluation, prioritization, and potential remediation of such future sites. The final report of the Future Sites sub-subcommittee is attached to this Report as Appendix C-1.

With respect to site priority ranking, the Subcommittee was tasked with reviewing the current model which is incorporated into the WQARF Eligibility and Evaluation Form (hereafter, "E&E Model"). After review of the existing E&E Model and comparison to models used around the country, the Subcommittee revised the model to be more sensitive to human exposure and more accurately rank sites according to actual and potential exposures. The Subcommittee's Final Report on the Proposed Revision to the Arizona Water Quality Assurance Revolving Fund Eligibility and Evaluation Form is attached to this Report as Appendix C-2. In summary, the Task Force recommends that Title 18 of the Arizona Administrative Code be revised to incorporate the revised E&E Model, as well as other recommendations on WQARF prioritization, listing, and delisting. Specifically, the Task Force recommends that agency decisions regarding site listing and prioritization not be subject to administrative appeal. Moreover, the Task Force recommends that ADEQ evaluate whether a threshold score for WQARF Priority Listing should be established. In addition, the Task Force recommends that ADEQ develop a guidance document to direct application of the revised E&E Model. The guidance would also include weighted factors and priorities for the listing of WQARF sites and the expenditure of WQARF funds.

The proposed E&E Model consists of two parts: a quantitative risk-based section; and a qualitative economic and social factors section. The quantitative section evaluates the relative risks of sites by assessing actual and potential contaminant exposure to human health and the environment. The total possible score of 120 is apportioned according to the following considerations: release event (10 points); site and contaminant characteristics (30 points); human exposure routes (65 points); and environmental factors (15 points). Social and economic factors are not scored.

II. PUBLIC PARTICIPATION SUBCOMMITTEE

A. Issues Addressed

The Groundwater Task Force believes that public participation regarding WQARF sites is essential to a workable WQARF program. While not expressly included in the list of issues for consideration by the Joint Select Committee, improvements in opportunity for public participation fall within the Joint Select Committee's charge for "evaluation of other issues that will result in a more efficient, fair and effective water quality assurance revolving fund program." Chapter 259, Section 14(C)(6). The goals of the Public Participation Subcommittee were to:

- 1) Assess the role of public notification, public participation, and community information at WQARF sites to identify needs and opportunities to improve the current community involvement requirements; and
- 2) Establish minimum standards and procedures to ensure successful implementation of public participation and community information programs that will facilitate groundwater cleanup cost-effectively.

B. Recommendations

The Task Force recommends both statutory and rule changes to modify the existing public participation program for sites listed under WQARF. The Final Report of the Public Participation Subcommittee is attached to this Report as Appendix D. In summary, the Subcommittee has proposed new statutory definitions of "Community," "Community Involvement Area," and "Public Information," and recommends programmatic revisions including (1) initial disclosures to be sent to all property owners within the Community Involvement Area, (2) community notices (Fact Sheets) to be sent to all affected members of the Community, and (3) creation of local repositories for distribution of follow-up information. Responsible parties will be required to conduct site surveys and interviews to identify issues of concern in the affected Community and facilitate public participation.

Depending upon the specific needs of the Community, Community Advisory Boards may be established to receive site briefings and progress reports, advise ADEQ, responsible parties, and the Community on issues of concern, and make additional recommendations on public participation. A Community Involvement Plan may be required to demonstrate compliance with the recommended public participation requirements. A spokesperson may be designated for the sites and newsletters distributed to inform the public of the site's status.

The Task Force recommends that ADEQ conduct an annual review of WQARF site and/or study areas to determine whether changes to the site or study area boundaries are warranted. The Task Force also recommends establishment of a process whereby affected property owners can petition ADEQ for adjustment of a WQARF site or study area boundary. A Site Description Package would be disclosed to the public prior to the recommended comment period for the Proposed Annual Priority List.

III. END USE SUBCOMMITTEE

A. Issues Addressed

The End Use Subcommittee examined issues related to the better or best end uses of remediated groundwater. The Subcommittee was tasked to make recommendations to facilitate that use through policy, rule, and statutory changes and improved interagency coordination, which together will remove or mitigate impediments and provide incentives for such end use. The following recommendations regarding, among other things, "incentives for the end use of remediated water" (Chapter 259, Section 14(C)(2)), are offered to the Joint Select Committee.

B. Recommendations

The Subcommittee's recommendations address three distinct issues related to end use of remediated groundwater: development of applicable quality standards; relief from liability for the transporter and end user of remediated groundwater; and the interface between the goals of WQARF and the goals of the Arizona Groundwater Management Act. The Final Report of the End Use Subcommittee is attached to this Report as Appendix E.

The lack of standards specifically applicable to the use of remediated groundwater appears to have contributed to delays in cleanups and reluctance on the part of potential end users and transporters to accept delivery of this water. Therefore, the Task Force recommends that ADEQ develop, by rule, end use standards, which may include numeric levels and operational controls, which shall be appropriate to specific end uses of remediated groundwater. The Subcommittee has developed a detailed background paper for use by ADEQ in developing proposed end use standards. The paper is incorporated in the Subcommittee's Final Report (Appendix E hereto) as Appendix 2.

Perceived or real liability for personal injury and/or property damage associated with transport or use of remediated groundwater is a significant impediment to timely cleanups. Therefore, the Task Force proposes two alternatives for liability relief: one would establish a standard of care for providers or users of remediated groundwater, compliance with which would shield the provider or user from liability; the other would require a person seeking to impose liability for personal injury or property damage on a provider or user of remediated water to prove willful, malicious or grossly negligent conduct on the part of such provider or user, which conduct was the direct cause of the damage.

With respect to the interface of WQARF and the Groundwater Management Act, the Task Force recommends that ADWR requirements be revised to incorporate three principles, effective through 2025, related to remedial actions: (1) that, for purposes of conservation accounting, remediated groundwater shall be accounted for in the same fashion as surface water; (2) that, within Active Management Areas ("AMAs"), persons conducting remediations requiring withdrawal of less than 250 acre-feet of groundwater per year shall be exempt from the replenishment obligation (but not from the requirement to beneficially use the water, whenever practicable); and (3) that, for municipal providers, the first 65,000 acre-feet of groundwater withdrawn statewide in AMAs for approved remedial projects shall not be debited from their AWS mined groundwater accounts. A phased-in replenishment obligation would apply to remedial pumping in excess of the 65,000 acre-foot cap. The deadline for application for this exception is 2010.

The Task Force also recommends, as a general matter, that the costs of use or discharge of remediated groundwater should be considered a part of the total remediation project costs. Additional recommendations regarding interagency cooperation are detailed in Appendix E.

IV. WELL DESIGN & USE SUBCOMMITTEE

A. Issues Addressed

The Well Design & Use Subcommittee addressed the fourth goal of the Groundwater Task Force: to provide ADWR and ADEQ authority to abandon, modify, and/or replace wells facilitating contamination. The recommendations made by the Task Force on well design and use fall within the Joint Select Committee's charge to conduct an "evaluation of other issues that will result in a more efficient, fair and effective water quality assurance revolving fund program." Chapter 259, Section 14(C)(6). The goals of the Subcommittee were as follows:

Address vertical cross-contamination (spreading of contaminants from a shallow aquifer to a deeper one, or from one horizon of an aquifer to another) as a matter of state law;

Develop methods of preventing vertical cross-contamination of aquifers in new wells;

Develop methods of identifying and mitigating vertical cross-contamination in existing wells; and

Address improving the accuracy of data and access to database systems in order to effectively mitigate and prevent vertical cross-contamination of aquifers.

B. Recommendations

The recommendations of the Well Design and Use Subcommittee are contained in the Final Position Paper -- Well Design and use Subcommittee, attached to this Report as Appendix F. In summary, the Subcommittee recommends that addressing vertical cross-contamination within groundwater contamination plumes should be a matter of consistent state law, *i.e.*, statutes and/or rules under existing ADEQ programs should be amended or modified so that they are consistent in addressing vertical cross contamination. Furthermore, a statutory definition of "vertical cross- contamination" should be adopted.

To prevent vertical cross-contamination in new wells, the Subcommittee recommends that the ADWR drilling approval process should be modified to incorporate further review relative to potential contamination. That review should identify wells being placed in areas of known contamination and should ensure that well designs in such areas utilize design constraints to avoid vertical cross-contamination. Optimally, this review will not delay the time required to process applications or notices of intent to drill.

A well inspection program is recommended to identify and mitigate vertical cross-contamination in existing wells. The program should first rank wells according to their potential to act as conduits for spreading contamination; only those wells with a high probability for spreading contamination will be further inspected. Assured funding for well inspection, modification, abandonment, and supplemental/replacement water supplies is also recommended.

in the preceding categories 1-3, the Subcommittee submits the table "Contaminants at WQARF Sites and Potential Sources," attached to this Report as Appendix G-2.

Substantial research and evaluation was conducted by the Subcommittee regarding potential WQARF funding sources. The principles guiding the Subcommittee in evaluating potential sources are described in Appendix G-3 to this Report. All funding source suggestions were evaluated and are presented; mere presentation does not indicate endorsement of a particular source or sources. The Subcommittee's work is presented in a series of tables, which are attached to this Report as follows:

Current WQARF Funding Sources	Appendix G-4
Proposed Increase to Existing Fees	Appendix G-5
New Fees and Taxes	Appendix G-6
New Fees and Taxes that Generate Less than \$500,000 in Revenue	Appendix G-7
New Financing Alternatives/Bonding	Appendix G-8
Fees and Taxes/Revenue Generation Unknown	Appendix G-9

Comments received from interested parties regarding the various funding source suggestions are attached to this Report as Appendix G-10.

VI. REMEDY SELECTION SUBCOMMITTEE

A. Issues Addressed

The Remedy Selection Subcommittee examined issues related to selection of appropriate remedies for contaminated groundwater plumes. The Subcommittee's recommendations are intended to assist the Joint Select Committee to "consider measures to encourage and expedite remediation of contaminated property." Chapter 259, Section 14(B)(2). Furthermore, the Subcommittee has made recommendations related to "incentives for early management of groundwater plumes to prevent migration and control sources of contamination." Chapter 259, Section 14(C)(4).

Accurate, accessible data on groundwater quality and existing water wells are necessary to a successful WQARF program and to implement the recommendations regarding Well Design and Use. The Subcommittee identified critical inadequacies in existing databases at ADEQ and ADWR and related poor interagency coordination, and the Task Force recommends that this problem be addressed as soon as possible through (a) establishment of a well verification program and (b) full funding of the AZURITE (Arizona Unified Repository for the Information Tracking of the Environment) program.

V. FUNDING SUBCOMMITTEE

A. Issues Addressed

The Funding Subcommittee examined issues related to funding of the WQARF program. The subcommittee's goal was to provide a menu of potential funding sources for consideration by the Joint Select Committee, together with specific policy recommendations regarding the nature of future WQARF funding. The Joint Select Committee is charged by HB 2114 to "consider options for an adequate dedicated source of funding for the water quality assurance revolving fund." Sec. 14(B)(4).

B. Recommendations

The Task Force makes a number of recommendations regarding the nature of WQARF funding; these recommendations are detailed in the final paper, "Funding Policy Issues Concerning Reform of the Water Quality Assurance Revolving Fund," attached to this Report as Appendix G-1. In summary, the Task Force recommends that certain aspects of the existing WQARF funding regime should remain in place, namely, current dedicated fees and taxes and the exemption from lapsing. The Subcommittee recommends that WQARF funds should not revert to the general fund, nor should WQARF funds generated from a particular source be restricted to cleanups related to that class of sources. The Task Force also recommends that with two exceptions, rulemaking/policy development and identification/prioritization of new sites, WQARF functions should be financed by continuous appropriations rather than annual appropriations, to facilitate multi-year cleanups.

The Task Force recommends that ADEQ promulgate rules creating criteria for expenditure of WQARF funds for preventative or mitigating measures prior to finalization of a Remedial Action Plan. It also recommends that a WQARF oversight committee be established and that a Program Authorization Review be conducted of WQARF every five years beginning in 2002.

As to the recommended sources of WQARF funding, the Task Force suggests the following "fairness" hierarchy: (1) those who polluted; (2) those who handle and dispose of toxic chemicals; (3) those who choose to use the products manufactured from these chemicals, and (4) those who receive relief from liability, if any, provided by WQARF reform. If reasonable taxes, fees, or other contributions from those sources are not sufficient, then some contribution from the general public may be needed. To assist the Joint Select Committee and other policymakers in analyzing potential funding sources, particularly

B. Recommendations

The "Final Recommendations of the Remedy Selection Subcommittee as Approved by the Groundwater Cleanup Task Force" are attached to this Report as Appendix H. In summary, the Task Force believes no statutory changes are required and recommends that ADEQ promulgate rules to implement the recommended remedy selection process. The rules would establish four Remedy Selection Criteria – risk, cost, benefit, and practicability. The rules would also list the range of Remedial Alternatives from which a party would select, including Plume Remediation, Physical Containment, Controlled Migration, Source Control, Monitoring, and No Action.

The Task Force recommends a five-step remedy selection procedure: (1) characterize the site; (2) set remedial objectives; (3) select a reference alternative (based on best professional judgment); (4) develop alternatives to the reference alternative; and (5) select the preferred alternative.

In the rulemaking process, the Task Force recommends that ADEQ incorporate incentives for initiating early interim action, provisions for voluntary remedial action, and a requirement that source control be considered for all remedial alternatives. Innovative technologies are also to be encouraged in the rules by providing appropriate relief.

The Task Force also recommends that remedial actions selected under the proposed rules should address wells that are now or are threatened to be impacted by groundwater contamination. The remedy shall incorporate measures to ensure that the supply of water available to the well owner is not reduced. Moreover, the Task Force recommends that adequate funding be provided to address impacted wells.

VII. LIABILITY AND FEDERAL LAW SUBCOMMITTEE

A. Issues Addressed

The Liability and Federal Law Subcommittee was charged with recommending an efficient and effective liability scheme to replace the joint liability scheme temporarily repealed by HB 2114. HB 2114 requires the Joint Select Committee to "consider alternate methods for determining liability among responsible parties and potentially responsible parties for remedial actions taken pursuant to state law, including possible processes for allocating that responsibility." Chapter 259, Section 14(B)(3). Furthermore, the Joint Select Committee is to develop recommendations to at least accomplish the "establishment of a process for the equitable apportionment of liability." *Id.*, Section 14(C)(3). The Task Force has tackled these issues by proposing two alternative liability schemes that will accomplish the goals set by the Task Force and address the issues to be considered by the Joint Select Committee.

B. Recommendations

While no consensus was reached on a specific proposal for "apportionment of liability" or "allocation of responsibility," the Task Force did agree on a general principle for reform of WQARF liability:

The Groundwater Task Force recommends the removal of joint liability contingent on **adequate dedicated funding** with incentives to reduce transaction costs and disincentives to deal with recalcitrant parties and a way to allocate liability shares.

The Task Force also resolved to forward to the Joint Select Committee two different proposals aimed at achieving the consensus goal. Proposal 1, referred to as the "Proportionate Share" Proposal, is described in a memorandum dated October 3, 1996, attached to this Report as Appendix I-1. Proposal 2, referred to as the "Source Liability" Proposal, is described in a memorandum dated October 2, 1996, attached to this Report as Appendix I-2. In forwarding the two proposals, the Task Force does not endorse one over the other.

The Proportionate Share Proposal

In summary, the Proportionate Share proposal would permanently repeal joint liability and replace it with an allocation process for all sites where two or more parties are alleged to be responsible. "Orphan shares" would be paid by the State. As proposed, the allocation process would begin after ADEQ has completed the site investigation and sent notice letters with a proposed allocation to known responsible parties ("RPs"). The allocation would be mandatory, non-binding, and conducted by a neutral, third-party allocator. During the allocation process, no party would be allowed to initiate litigation under WQARF for cost recovery or contribution regarding the subject WQARF site. As an incentive to reduce transaction costs, a party who chooses to settle prior to selection of the allocator would receive a 20% discount off of its allocated percentage of liability. One proposed variation would offer a 30%, rather than 20%, discount. If after the allocation process is completed the parties cannot reach agreement, they may proceed to Superior Court, which would give no deference to the allocator's decision. However, the proposal provides financial disincentives to litigation. As an additional disincentive to recalcitrance, parties who refuse to participate in the allocation process will be required to pay the State's or private plaintiff's costs and fees, and may also be assessed a penalty up to the amount of the entire "orphan share." In judicial proceedings initiated by the State, the burden of proof regarding equitable allocation factors, such as ability to pay, volume and toxicity of the substances involved, etc., would remain with the defendant. Some Task Force members suggested a variation placing the burden on the defendant.

The Proportionate Share proposal offers an exemption from liability under WQARF for qualifying small businesses and individuals. Among other things, the exemption is conditioned upon cooperation in connection with the remedial investigation and remedy implementation. No exemption is offered from criminal

liability, and the business or individual must agree to an environmental audit of their facilities and prospectively comply with all environmental laws and regulations. Also, to facilitate the allocation process and identify as many responsible parties as possible, the Proportionate Share proposal would enhance the State's authority to gather information about a site or a party's involvement with the site.

The Source Liability Proposal

In summary, the Source Liability proposal would permanently repeal joint liability for regional groundwater contamination and replace it with a "bright-line" allocation, whereby responsible parties would be required to pay for "source" remediation regardless of when the release occurred, and remedy of "non-source" contamination would be paid for by the WQARF fund. To qualify for this allocation, the responsible party must enter into a written agreement with the State committing to conduct the "source" remedy and cooperate with the agency in connection with the remedial investigation and remedy implementation. No exemption from liability for small businesses or individuals is proposed.

The definition of "source" includes (1) soils contaminated in excess of applicable soil cleanup standards; (2) undissolved liquids (free product) in soil or water; or (3) dissolved organic contaminants in water at levels greater than a specified threshold. Inorganic contaminants, dissolved or not, can also be a source; however, no technical definition is proposed at this time. The exact wording of the "source" definition, including diagrams, is attached to this Report as Appendix I-3.

Where more than one party is alleged to be responsible for "source" contamination, a mandatory, non-binding allocation process based upon equitable factors is established to apportion liability shares. ADEQ is responsible for identifying all responsible parties. With respect to "source" contamination, liability is joint and several, i.e., responsible parties must pay for any "orphan" share. With respect to "sources" in groundwater, subject to the remedy selection process described above, the responsible party must conduct cleanup only to the specified threshold level; once treated to that level, the contaminated groundwater is no longer a "source" and responsibility for remediation shifts to the WQARF.

The allocator's decision may be challenged in Superior Court, which must give deference to the allocation. If the challenge is initiated by ADEQ, it bears the burden of providing the RP's share and must pay the RP's costs and attorney fees if ADEQ does not "prevail" in the challenge.

The Source Liability proposal specifies that responsible parties remain subject to the liability provisions of other applicable state environmental laws. To the extent that financial assurance has been provided in accordance with such laws, that money shall be used for "non-source" contamination before WQARF funds are used. The Source Liability proposal also would preclude the State from using CERCLA to the extent it is inconsistent with state law, except in specified circumstances.

Cost Estimates

The Task Force recognized that increased funding for WQARF will be necessary under either the Proportionate Share or Source Liability proposal. Both proposals contemplate that the WQARF will pay for "orphan shares." The Task Force did not reach consensus on the level of additional funding that will be needed for "orphan shares" under either liability proposal, although it was believed the Source Liability proposal would require relatively greater funding. Likewise, the Task Force did not reach consensus on what amount of money would constitute "adequate, dedicated funding" for any alternative liability scheme. Nevertheless, ADEQ has prepared cost estimates associated with the two proposed alternatives for fiscal years 1998 and 1999. The Task Force agreed to forward the ADEQ cost estimates to the Joint Select Committee for its information, with the caveat that some Task Force members believe that the estimates are too high, and other Task Force members believe that the estimates are too low. Detailed information regarding the cost estimates is attached to this Report as follows:

Organization Chart/Program Costs under Proportionate Share	Appendix I-4
Organization Chart/Program Costs under Source Liability	Appendix I-5
Detail -- Staff Costs, PASI, and Community Involvement	Appendix I-6
Summary -- Past Remedial Action Costs/Responsible Parties	Appendix I-7

To summarize, ADEQ estimates that combined program costs and site cleanup budgets under the Proportionate Share proposal will be \$20,385,509 in fiscal 1998 and \$24,826,849 in fiscal 1999. Combined program costs and site cleanup budgets under the Source Liability proposal are estimated at \$29,258,759 in fiscal 1998 and \$49,346,349 in fiscal 1999. Written comments and concerns submitted to the Task Force regarding ADEQ's estimates are attached to this Report as Appendix I-8.

Concluding Resolution
Groundwater Cleanup Task Force
November 7, 1996

The members of the Groundwater Cleanup Task Force endorse the final recommendations of the following Task Force subcommittees:

1. Site Prioritization
2. Public Participation
3. End Use
4. Well Design and Use
5. Funding
6. Remedy Selection

The Task Force further endorses favorable legislative consideration of such recommendations.

The Groundwater Cleanup Task Force has intensively considered, debated, and negotiated issues relating to the liability provisions of the Arizona WQARF program. As a result of that process, the Task Force unanimously agreed to the following general principle relating to the issue of WQARF liability: "The Task Force recommends the removal of joint liability contingent on **adequate dedicated funding** with incentives to reduce transaction costs and disincentives to deal with recalcitrant parties and a way to allocate liability shares." The Task Force has been unable, however, to reach consensus on either an alternate liability scheme or on the amount of what would constitute adequate dedicated funding for an alternate liability scheme.

As a result of the Task Force process, however, two proposals have been advanced, each with comments and variations thereto. Both would change WQARF's liability features to varying degrees and both would shift to WQARF, to varying degrees, greater responsibility to conduct soil and groundwater remedial actions at state expense. No consensus has been reached on a single proposal. Likewise, consensus has not been reached on the level of increased costs which would be shifted to WQARF by each proposal. Some members feel that estimates prepared by ADEQ of WQARF funding needs associated with the two proposals are too high and some members feel that such estimates are too low. The Task Force has, therefore, decided to report out both proposals to the Joint WQARF Legislative Committee as well as the estimates of ADEQ.

In reporting out both proposals and ADEQ's estimates, individual Task Force members are not necessarily endorsing both proposals nor ADEQ's estimates; nor does the Task Force endorse any proposal unless such proposal would be adequately funded from dedicated funding sources. Task Force members look forward, therefore, to continuing to vigorously participate in the legislative debate on WQARF liability and liability funding issues.

**SUMMARY OF THE GROUNDWATER
CLEANUP TASK FORCE'S RECOMMENDATIONS
AND DECISIONS**

FEBRUARY 29, 1996 MEETING.

No recommendations were adopted and no substantive decisions were reached.

MARCH 14, 1996 MEETING.

The following decisions were reached:

1. Members of the Task Force would adhere to the open meeting and public records laws.
2. Sub-groups will make recommendations and will try to follow the spirit of the open meeting law whenever possible, but they are not bound by the open meeting law.
3. The Task Force will use a grudging consent model rather than voting to make decisions.

MARCH 28, 1996 MEETING.

No recommendations were adopted and no substantive decisions were reached.

APRIL 11, 1996 MEETING.

The following decisions were reached:

1. Jim Derouin and Karen Peters accepted to act as co-chairs for the Task Force.
2. There will be no agreement on anything until agreement exists on everything. This means that "interim" agreements by members of the Task Force will not be binding until final agreement is reached on an entire legislative package.
3. No end runs. This means all Task Force members will support, without amendment, the work product of the Task Force. If any legislative amendments are made, they will be subject to the consensus approval of Task Force members.

4. If a subcommittee cannot reach consensus on an issue, alternative proposals will be prepared for consideration by the Task Force. If the Task Force cannot reach consensus on an issue, alternative proposals can be prepared for consideration by the legislative subcommittee.

APRIL 18, 1996 MEETING.

No recommendations were adopted and no substantive decisions were reached.

MAY 9, 1996 MEETING.

The following decision was reached:

1. The Task Force approved an exception to the rule that chairs of all subcommittees need to be members of the Task Force. The Remedy Selection Subcommittee will be co-chaired by Tom Suriano, a Task Force member, and Chris Thomas, who is not a Task Force member.

JUNE 6, 1996 MEETING.

The following decisions were reached:

1. Press releases may be drafted by any member or subcommittee; but should be approved by the co-chairs.
2. **WELL DESIGN & USE:** The Subcommittee was asked by the Task Force to prioritize their recommendations based on different levels of funding.

JUNE 20, 1996 MEETING.

The following decisions were reached:

1. **LIABILITY & FEDERAL LAW:** The first sentence of the action item on Joint Liability was approved by the Task Force with a direction to the Subcommittee from the Task Force to define the terms used in the sentence. (The sentence was not made part of the Minutes, but stated as follows:

The Task Force should recommend the removal of joint liability contingent on adequate dedicated funding with incentives to reduce transaction costs and disincentives to deal with recalcitrant parties and a WAY TO ALLOCATE LIABILITY SHARES. (Emphasis in original text.) (The statement is contained in the Final Minutes of the Liability/Federal Law Subcommittee's meeting on June 12, 1996.)

2. **FUNDING:** The presentation format would be changed to read "tax/fee" in all instances where tax or fee is used.

JULY 11, 1996 MEETING.

The following decisions were reached:

1. **LIABILITY & FEDERAL LAW:** The McCabe/McKinley presentation (given at the June 6, 1996 meeting) attachment was approved with minor changes to the McCabe presentation and no changes to the McKinley presentation. The presentation was added to the June 6, 1996 minutes. (A copy of the McCabe presentation and related Minutes are attached and marked Exhibit "1".) (Katherine McCabe was from the Department of Justice in Washington, D.C. and Chuck McKinley was from EPA region IX. They spoke on liability options.)
2. **REMEDY SELECTION:** The Task Force approved the approach of the Remedy Selection Subcommittee and resolved that the absence of human health risk does not preclude the adoption of a response.

JULY 25, 1996 MEETING.

No recommendations were adopted and no substantive decisions were reached.

AUGUST 8, 1996 MEETING.

The following decisions were reached:

1. **END USE:** The Task Force achieved consensus on the End Use Subcommittee's proposal, which was not attached to the Minutes, but stated as follows:

The lack of formal, ADEQ sanctioned end use standards specifically applicable to the use of remediated groundwater appears to have contributed to delays in cleanups and reluctance on the part of potential end users and transporters of remediated groundwater to accept delivery of this water.

ADEQ should develop by rule end use standards, which may include numeric levels and operational controls, which shall be appropriate to specific end uses of remediated groundwater, for inclusion in Title 18 of the Arizona Administrative Code. Any end use standards developed will address those contaminants most commonly encountered in groundwater remediation projects, and may distinguish between remediated groundwater transported in a constructed water conveyance system, and remediated groundwater applied directly to that specific end use. Any rules developed for end use standards should also permit the development of site specific end use standards and controls utilizing a risk assessment methodology acceptable to the Director of ADEQ. End use standards developed for remediated groundwater shall be applied pursuant to an approved Remedial Action Plan. (The foregoing is contained in the Subcommittee's final report.)

2. **SITE PRIORITIZATION:** The Task force answered the following questions posed by the Subcommittee:
 1. Yes, funding can be used for conducting investigations to prioritize sites, but there should be a limit on how much money is spent annually. A goal of 20% is recommended.
 2. Even if a site does not affect or threaten waters of the state, but poses a threat to human health, it must be prioritized just like all other sites.
 3. Sites should not be re-prioritized annually.
 4. The prioritization model must weigh human health risk above ecological risk.

5. Factors such as social, economic, and cost-benefit issues should be considered, but not scored.
6. Site prioritization should be subject to public comment and each comment should receive a substantive response.
7. A request can be made to re-prioritize a site based on new evidence.
8. The director should have the final decision-making authority on prioritization issues with no administrative appeal.

AUGUST 22, 1996 MEETING.

The following decisions were reached:

1. **END USE:** In the section of the Subcommittee's proposal on "Costs", a sentence was changed to read: "The costs of use or discharge of remediated groundwater should be included in the total remediation project costs." (A copy of the Subcommittee's "Proposal for Task Force Consideration, Aug. 22, 1996" is attached to the Task Force's final report and marked Exhibit "E".)
2. **END USE:** In the section of the Subcommittee's proposal on "Statutory/Regulatory Conflicts", the first sentence was made to read: "The directors would be granted authority, subject to criteria ensuring the protection of public health and the environment, to waive regulatory requirements which conflict with specific remedial action plans the Department(s) would otherwise approve."
3. **END USE:** In the section of the Subcommittee's proposal on "Agency Cooperation", the sentence was made to read: "Establish a process for ADWR and ADEQ to work together with the RPs to identify and facilitate end uses early in the process of developing remediation options, and approve the selected use or discharge option."
4. **END USE:** In the section of the Subcommittee's proposal on "Liability", which stated: "To provide incentives for beneficial use of remediated groundwater and minimize current barriers to its use, establish liability limits for providers of water who accept remediated water and for users of

remediated water. Approaches are: Indemnification; Immunity; Liability Limits Based on a Standard of Care.” was approved by the Task Force.

AUGUST 29, 1996 MEETING.

The following decisions were reached:

1. **WELL DESIGN & USE:** The database upgrade is critical not only to the success of the proposed well inspection program but also to groundwater remediation efforts in general. The Task Force wants this upgrade to proceed. There are obstacles, but they must be worked through.
2. **END USE:** The Subcommittee should look at implementation of the database upgrade and provide cost estimates for the upgrade to the Task Force.
3. **PUBLIC PARTICIPATION:** The Task Force agreed that notifying the public is a good idea.
4. **FUNDING:** The Task Force recommended that the Memorandum and table regarding “Contaminants at WQARF Sites” dated August 26, 1996, include petroleum. (A copy of the Memorandum is attached to the Task Force’s final report and marked Exhibit “G-2”.)

SEPTEMBER 19, 1996 MEETING.

The following decision was reached:

1. **END USE:** The Task Force agreed to send the two following proposals:

Proposal #1

With respect to the actions for personal injury or property damage arising out of the transportation, distribution or use of remediated water; remediated water shall be deemed reasonably safe and fit for consumption and use, and the provider or user shall be deemed to have acted reasonably, if:

1. The remediated water complies with applicable state or federal standards, or

2. The remediation has been conducted pursuant to an approved remedial action plan under WQARF, or
3. The remediation has been conducted pursuant to an approved consent decree under CERCLA.

For purposes of this section only:

1. A "provider" is an owner or operator of a constructed water conveyance system, which conveys water for industrial, municipal or irrigation purposes;
2. A "user" is an entity which accepts remediated water and utilizes such water for industrial, municipal or irrigation purposes.

Proposal #2

Any provider or user of remediated water is not liable for damages caused or contributed to by the use or distribution of the remediated water except upon a showing of willful, malicious, or grossly negligent conduct which was the direct cause of the damages.

For purposes of this section only:

1. "Provider" means owners or operators of constructed water conveyance systems for industrial, municipal or irrigation purposes;
 2. "Damages" means death or injury to a person, or claims for medical monitoring, or injury that a person may suffer, or property damage that would be actionable absent the liability limitation granted herein;
 3. "Remediated water" means water that is used or discharged in connection with a CERCLA or WQARF remediation, or that meets applicable state or federal standards.
2. **END USE:** The Task Force agreed that "The strawman will go forward as proposed to ADEQ." (A copy of the subcommittee's "Presumptive End Use

'Standards' Proposal, A Conceptual Process Originating From An ADEQ Strawman Proposal, September 11, 1996" is attached to the Subcommittee's final report.)

SEPTEMBER 26, 1996 MEETING.

The following decision was reached:

1. **FUNDING:** The Task Force accepted the Subcommittee's Policy Issue paper with the following revisions:
 1. The paper will reflect that public funding was not recommended, but that there may need to be tax/fee or other contribution, if funding from other sources is not adequate.
 2. Bullet 4 (establishment by public vote) was deleted and changed to "None". Bullet 6 was revised to reflect this change.

(The foregoing changes are contained in the Subcommittee's final report.)

OCTOBER 3, 1996 MEETING.

The following decision was reached:

1. **LIABILITY & FEDERAL LAW:** The Task Force decided that the definition of "source" was critical to making a decision on a liability scheme.

OCTOBER 10, 1996 MEETING.

The following decisions were reached:

1. **SITE PRIORITIZATION:** The Task Force adopted Recommendation #1 (proposed E & E model), except delete the social and economic factors. (A copy of the Subcommittee's "Revised Eligibility And Evaluation Form" was not attached to the Subcommittee's final report, but is attached to the Task Force's final report and marked Exhibit "C-2".) Section IID on pages 14 and 15 of the Subcommittee's final report improperly includes the language on social and economic factors that should have been deleted.

2. **SITE PRIORITIZATION:** The Task Force adopted Recommendation #2 (develop guidance and provide training to ensure consistent scoring of sites) with the addition of: (1) a direction to ADEQ to develop guidance with assistance from interested persons and (2) the guidance document should include a list of assumptions. (The foregoing changes are contained in the Subcommittee's final report at pages 12 - 14.)
3. **SITE PRIORITIZATION:** The Task Force adopted Recommendation #3 (make statutory and regulatory revisions to implement the evaluation form) with the addition that statutory and regulatory revisions will be recommended to implement the model, including improvements to the listing and delisting process. (The foregoing changes are contained in the Subcommittee's final report in the Executive Summary at page 1.)
4. **REMEDY SELECTION:** The Task Force accepted the Subcommittee's recommendations, but changed Recommendation #8 to delete "meet applicable standard" and replaced it with "be fit for its current or reasonable foreseeable future uses." (The foregoing changes are contained in the Subcommittee's final report.)
5. **FUNDING:** The Task force accepted the Subcommittee's policy recommendation on whether WQARF should provide funding for preventative measures (the Tolleson issue) with the following changes: (1) delete the first paragraph of the recommendation because it is addressed by the Remedy Selection Subcommittee recommendations #8 and #9 and (2) add: "Direct ADEQ to establish by rule criteria for when WQARF funds may be advanced prior to finalization of a RAP, and under what conditions the beneficiary should reimburse WQARF if the action is determined to have been unnecessary under the RAP. The criteria should address at a minimum the ability of the beneficiary to repay and the relationship of the proposed activity to the priority list." (The foregoing changes are contained in the Subcommittee's final report.)
6. **LIABILITY & FEDERAL LAW:** The Task Force adopted the following definition of "source":
 1. Concentrations of contaminants in soil above the groundwater table that exceed the applicable soil clean up standard as defined in R18-7-201 through 209. (This definition was changed at the October

21, 1996 meeting.)

2. Any identifiable non-aqueous phase liquids (e.g. free product) in soil or water.
3. Zones of dissolved phase organic contaminants in surface water or groundwater at levels greater than or equal to 1% of the solubility of the contaminant or contaminants.
4. Plumes of inorganic contaminants as defined at the October 21, 1996 meeting of the Task Force.

OCTOBER 21, 1996 MEETING.

The following decisions were reached:

1. **LIABILITY & FEDERAL LAW:** The Task Force changed "source" definition #1 to read: "Concentrations of contaminants in soil above an aquifer that exceed applicable soil clean up standards established pursuant to A.R.S. 49-151 & 49-152."
2. **LIABILITY & FEDERAL LAW:** The Task Force agreed to wait until Clean Sites West gave its presentation and then it could revise its cost estimates as necessary.

OCTOBER 24, 1996 MEETING.

The following decisions were reached:

1. **WELL DESIGN & USE:** Task Force grudgingly consented to accept the Subcommittee's "Third Draft Well Design and Use Subcommittee Position Paper dated October 1996", except that the Task Force changed the term "hold harmless agreement" with "covenant not to sue by the State". (The foregoing change is contained in the Subcommittee's final report.)
2. **WELL DESIGN & USE:** The Task Force agreed to support AZURITE development because the agencies (ADEQ and ADWR) need these systems to operate effectively. The Task Force decided: "In recognition of the database needs identified in the Well Design and Use Subcommittee position paper, the

Task Force recommends implementation and full funding from the General Fund for AZURITE.

3. **WELL DESIGN & USE:** The Task Force instructed the Subcommittee to revise its report to include references to AZURITE and insert the following new sentence in two places in the position paper (Sections 5.3 and 5.4): "The Task Force believes the following recommendations should be implemented through the Arizona Unified Repository for the Informational Tracking of the Environment (AZURITE) program (see attached white paper)." (The foregoing change is contained in the Subcommittee's final report.)
4. **PUBLIC PARTICIPATION:** The Task Force adopted the following option that will replace the need to define a plume buffer area for the CIA: "... the WQARF site and/or study area and any geographical area found appropriate in the Director's sole discretion." The Task Force deleted the definition of "plume buffer area". (The foregoing changes are contained in the Subcommittee's final report.)

NOVEMBER 4, 1996 MEETING (minutes not yet approved and made final).

The following decisions was reached:

1. **PUBLIC PARTICIPATION:** The Task Force approved the Subcommittee's recommendations, provided that "only sites 'designated' under WQARF require public notification, public participation and community information processes. Specifically, 'designated under the WQARF program' is to be inserted in Section 1.0 of the RECOMMENDATIONS after the phrase 'at all existing or proposed WQARF sites and/or areas.'" (Capitalization in original text.) (The foregoing change is contained in the Subcommittee's final report.)

NOVEMBER 7, 1996 MEETING (minutes not yet approved and made final).

The following decisions were reached:

1. **LIABILITY & FEDERAL LAW:** The Task Force agreed that "forwarding two liability proposals to the legislature does not necessarily mean approval of both proposals. Forwarding more than one proposal is merely an indication that the Task Force couldn't reach consensus, but was able to narrow the possible choices of liability schemes. As a result, all parties are free to argue

that one or the other proposal is the best -- or to argue that neither is acceptable if adequate, dedicated funding is not provided. However, they are not free to develop a third or fourth proposal completely independent of the forwarded proposals. Everyone will be allowed to debate the funding issue in exchange for attaching the DEQ cost estimates to the proposals.”

2. **END USE:** The Task Force approved and accepted the three following principles recommended by the Subcommittee with a numeric volumetric cap to be determined at a later date:

Principle #1 Conservation Accounting: remediated groundwater withdrawn pursuant to WQARF, CERCLA or other applicable Federal or State Law shall be accounted for by ADWR in the same way that surface water is accounted for in conservation accounting.

Principle #2 Small Volume Exception: Remediated groundwater in volumes of 250 acre-feet or less per project per year withdrawn pursuant to WQARF, CERCLA or other applicable Federal or State Law shall be exempt from all replenishment obligations but shall be subject to the requirement that the groundwater withdrawn be used beneficially, wherever practicable.

Principle #3 Assured Water Supply; Annual Volumetric Cap: Remediated groundwater withdrawn pursuant to WQARF, CERCLA or other applicable Federal or State Law shall not be debited from an End User's Assured Water Supply (AWS) mined groundwater account. ADEQ, ADWR and the regulated community will attempt to reach consensus before December 1 on an annual volumetric cap of remediated water not to be debited. Should the total annual volume of remediated water used by parties who have Assured Water Supply mined groundwater accounts exceed the volumetric cap, all such uses in excess of the cap shall be subject to a phased in replenishment obligation.

3. **SITE PRIORITIZATION--FUTURE SITES SUBGROUP:** The Task Force decided that:

1. The final report will include the two new pages distributed during the meeting (November 7, 1996) and the DeMarr/Strassburg

letter that accompanied the original report. (A copy of the letter is attached to the Task Force's final report and marked Exhibit "C-1".)

2. The remainder of the report would be marked "draft" with appendices 1, 3, 8, 11 & 12 and all references to the appendices removed.

3. The two new pages were amended to further emphasize the conclusion that there will be future sites.

4. The final sentence of the third paragraph was amended to read: "The only consensus that the Groundwater Cleanup Task Force could reach is that the report supports the proposition that there will be future WQARF sites which should be addressed in funding determinations for near, medium, and long term future sites." (Emphasis in original text.)

5. The first sentence in the fourth paragraph was changed to read: "The Groundwater Cleanup Task Force has not rectified the deficiencies in the draft report, but will review the draft to remove all references to individual sites, including those appendices that reference individual sites in the draft report."

6. The third sentence of the fourth paragraph about soliciting public comment was deleted.

4. **SITE PRIORITIZATION:** The Task Force amended the final sentence of the first paragraph in the Executive Summary on page 1 of the Site Prioritization Subcommittee Final Report on the Proposed Revision to the Arizona WQARF Eligibility and Evaluation Form Dated October 3, 1996 to read: "In addition, the subcommittee recommended that the guidance document be developed, which would be essential to application of a model, including the establishment of weighted factors and priorities for the listing of WQARF sites and expenditure of WQARF funds." (Emphasis in original text.) (The foregoing change is contained in the Subcommittee's final report.)
5. **SITE PRIORITIZATION:** The Task Force added a sentence at the end of the second paragraph in the Executive Summary: "This shall be addressed in the above-referenced guidance document." Furthermore, the final sentence of paragraph 4 is amended to read: "Additionally, Title 18 would have to be

amended in order to incorporate the proposed model, to modify the rules regarding listing, and to include delisting." (Emphasis in original text.) (The foregoing changes are contained in the Subcommittee's final report.)

6. **CONCLUDING RESOLUTION:** The Task Force agreed upon Draft 4 of the Concluding Resolution. (A copy of the "Concluding Resolution, Groundwater Cleanup Task Force, November 7, 1996, Draft 4" is attached to the Task Force's final report and marked Exhibit "A".)

4496 12-18-96

**REPORT OF THE SUBCOMMITTEE
ON PRIORITIZATION TO
THE ARIZONA GROUNDWATER TASK FORCE**

By Ethel DeMarr and Roger Strassburg
September 25, 1996

This Report transmits to the Groundwater Task Force the Draft Report of the Subcommittee on Future Sites ("Draft"), which provides a rough estimate of the number of potential future WQARF sites. On September 25, 1996, the Subcommittee on Prioritization considered the Draft and decided to submit the Draft for criticism, discussion, supplementation, and (it is hoped) amendment. To promote constructive criticism leading to amendment, the Subcommittee on Prioritization sets forth herein its deep and abiding reservations about the Draft and its belief that the Draft has some utility, however limited, in its present form.

First, the subject matter of the Draft is essentially unknowable. What new WQARF sites will turn up in the next 30 or 40 years is no more capable of estimation than weather conditions or stock prices 30 or 40 years from now. The present may be a predictor of the future, but no one knows for sure or how much. Though unknowable, however, the issue is unavoidable and important for practical policy planning. An appreciation of the dimensions of what is not known is useful where the consequences of today's planning will not be fully known for years. The only conclusion that the Draft will permit with anything approaching reasonable confidence is that the next 30 years will probably see new WQARF sites, but no one knows how many.

Second, the Draft does not answer the question as to how many of the future WQARF sites will require public money. This question turns on the liability scheme to be adopted - a matter far from settled. Also, this question turns on the identity of the responsible parties and orphan shares, which no one knows.

Third, the Draft's estimate of 277 future WQARF sites is certainly wrong, and substantially so, due to the shortcomings in the data. To counter balance those flaws in accuracy, the Draft seeks to be honest and open in articulating the arbitrary assumptions on which its conclusions are based. Where the data permitted, corroborating data was used to test the reasonableness of the conclusions. Since the accuracy of the corroborating data was no better than the other data, the degree of actual corroboration is low. Where corroborating data was not at hand, the Draft sets forth the assumptions used in place of facts in the belief that being lost in the daytime was preferable to being lost in the dark.

Finally, the frank question confronting the Subcommittee was whether the Task Force would benefit from the Draft's conclusions which are wrong, if reasonable, though rude and crude. The Subcommittee decided that the Task Force would probably benefit from the Draft, however incrementally. The Subcommittee concluded that it is reasonable to plan for future WQARF sites, although the number is indeterminate. The Subcommittee also hoped that public release of the Draft at this time would, like the grit in the oyster, prompt the generation of better data from industry and public sectors to better inform the conclusions of the Draft.

The Future Sites sub-subcommittee of the Ground Water Task Force undertook the assignment of trying to determine if there is a reasonable probability that there will be additional WQARF sites in the State of Arizona that are not currently included on the priority list of 28 sites. To that end, the committee spent considerable time and effort investigating relevant information that could provide some insight into the question. Resources that were utilized included review of documents and information relating to the dry-cleaning industry, the mining industry, non-RCRA (old) landfills, RCRA sites, information on the usage of chemicals in various industrial and pesticide operations, and discussions with representatives from ADEQ and ADWR.

The preliminary results of that investigation were contained in a draft report dated 9-25-96, entitled "Report of the Sub-Subcommittee on Future Sites to the Subcommittee on Priorities of the Arizona Groundwater Task Force," by Roger Strassburg, Jr., chairman. Roger Strassburg and Ethel DeMarr transmitted with the report a cover letter explaining the deficiencies in the data, in the assumptions, and in the conclusions of the report. The letter explained that the number of future WQARF sites is indeterminable based on existing knowledge and data, and hence no valid estimate can be made about the monies needed to clean up future sites.

The Task Force felt uncomfortable about the report, because of its deficiencies. The Task Force did not believe that the report could be used as a basis for determining the number of future sites or the projected cost of remediating future sites. Public comments were received on the report that emphasized the report's limitations. The only consensus that the Groundwater Task Force could reach is that the report supports the proposition that there will be future WQARF sites which should be addressed in funding determinations for near, medium and long term future sites.

The Groundwater Task Force has not rectified the deficiencies in the draft report, but will revise the draft to remove all references to individual sites, including those appendices that reference individual sites in the draft report. The revised draft report will include both the cover letter and the public comments received on it. The Task Force has reached the following conclusion and recommendations on the subject of future WQARF sites:

Conclusion:

The Subcommittee on Prioritization has concluded that there are insufficient data available at this time to estimate with any degree of confidence the number of future WQARF sites. Hence, no reliable projections presently can be made about the cost of remediating future sites. However, there will be future sites, although the exact number is indeterminable.

Recommendations:

1. Adequate money should be provided to investigate, evaluate, and prioritize future sites to determine whether public funding under WQARF is necessary for remediation.
2. Criteria should be published which ADEQ must satisfy before a site is targeted for on-site investigation as a potential future site.
3. Whatever funding mechanism is adopted for remediation of existing WQARF sites should have sufficient flexibility in duration or escalation of funding level to take into account future sites.

Site Prioritization Subcommittee

*Final Report
on the*

Proposed Revision to the
Arizona Water Quality Assurance Revolving Fund
Eligibility and Evaluation Form

for the

Groundwater Cleanup Task Force

Dated

November 12, 1996

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I. EXECUTIVE SUMMARY

The Site Prioritization Subcommittee of the Groundwater Cleanup Task Force was tasked with reviewing the current model for the ADEQ WQARF Eligibility and Evaluation Form. Upon review, the subcommittee determined that the current model, which has not been updated since its inception in 1987, was in need of renovation and has proposed a revised form based on a new model. In addition to the current model, the subcommittee reviewed the models of the US EPA, the Department of Defense, the Department of the Interior, the ADEQ UST Section, and the States of California, Delaware, Massachusetts and Texas, in order to incorporate the best of the available information on this subject. The proposed model would consist of two parts: a quantitative risk-based section; and a qualitative economic and social factors section. In addition, the subcommittee recommended that a guidance document be developed, which would be essential to application of the model including the establishment of weighted factors and priorities for the listing of WQARF sites and the expenditure of WQARF funds.

For the proposed model, the quantitative section would evaluate risk by assessing actual and potential contaminant exposure to human health and the environment by a release, and would be based on a 120 point scale. That point total would be apportioned into the following sections: release event (10 pts.); site and contaminant characteristics (30 pts.); human exposure routes (65 pts.); and environmental factors (15 pts.). The proposed model was created so that comparison of a site's score to the maximum 120 points was not as critical as that of scores among individual sites. Therefore, no threshold score for inclusion on the priority list was determined. This shall be addressed in the above referenced guidance document.

When current WQARF priority sites were scored using the proposed model, the ranking of sites was different from the ranking of sites using the current model. In the proposed model, the greatest amount of points in the human exposure section was assigned to the groundwater pathway, and within each pathway actual exposure was given more points than potential exposure. Sites with groundwater contamination and those with contamination of multiple media scored highest. For these reasons the subcommittee is confident that the proposed model provides for a scoring of sites in a manner which is more protective of human health than the current model.

In order to implement this proposed form, the subcommittee concluded that the WQARF statute should be amended to implement two decisions by the Task Force: the inclusion of sites that affect human health but do not affect or threaten waters of the State; and the exemption of the site prioritization decision from administrative appeals. Additionally, Title 18 would have to be amended in order to incorporate the proposed model, to modify the rules regarding listing, and to include delisting.

The group recommends that the proposed model, rather than the current model, be utilized by the Director of ADEQ to assist in deciding which sites are eligible for inclusion on the WQARF site priority list.

II. PROPOSED MODEL DEVELOPMENT

A. Criteria for Proposed Model

The original Arizona Department of Environmental Quality (ADEQ) Eligibility and Evaluation Form ("current model") for Arizona Water Quality Assurance Revolving Fund (WQARF) sites was created in 1987 after the passage of the original WQARF statute. Since that time, the Current model has been neither amended nor updated to reflect changes in the statute and regulations. The Groundwater Cleanup Task Force charged the Site Prioritization Model Working Group ("working group" or "group") of the Site Prioritization Subcommittee to review the current model and determine if it needed to be updated.

After reviewing several different models, the group decided to use the current model as a starting point to create a proposed model that could be more sensitive to human exposure, and could more accurately rank sites according to actual and potential exposures. The results of this proposed model would be evaluated to determine if the site would be included on the WQARF priority list. The group determined that the proposed model should have the four characteristics listed below:

- Flexibility: The model must be modular and adaptable so that any changes in the law or policy may be quickly incorporated.
- Reproducibility: The model must be objective so as to yield the same results no matter who does the scoring.
- Equity: Application of the model must be the same for all parties.
- Defensibility: The results of the model and the resulting site prioritization list must be defensible based on good science and reasonable decision making.

With these technical and practical objectives in mind, the group reviewed other models, created a proposed model, tested the model on the current WQARF priority sites, revised the model, and then drafted this final report. A copy of the proposed model is attached as an appendix to this report.

The group recommends that a guidance document be prepared for implementation and communication of the model. While the model is protective of human health and the environment, the model will be ineffective without reliable and consistent application. The guidance document will serve as a tool to ensure that the implementation of the model for

WQARF sites will meet the characteristics listed above. A preliminary list of issues for the Guidance Document is given in section II.C.3 below.

B. Review of Other Existing Models

In an attempt to incorporate the good work of others, and to not reinvent the wheel, the working group researched and analyzed site prioritization models from other state and federal government entities. The group members identified and examined other appropriate models, which are listed in Table 1. In addition to these models, the working group also reviewed the Department of Interior's Abandoned Mine Hazard Evaluation Handbook, the Final Report of the Federal Facilities Environmental Restoration Dialogue Committee, and the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) Site Evaluation Task Force Pre-Remedial Survey. These materials were useful as background information, but the working group decided that it did not require additional analysis.

Representatives from each federal and Arizona entity gave presentations. Even though personnel from other states were unavailable to present their models, each was reviewed by the group, and we are appreciative of the representatives of those states who made their models available. Additionally, each representative answered a list of questions concerning the substantive and procedural aspects of their particular system. The strawman list of questions and all models reviewed are available from the Site Prioritization Subcommittee upon request. After assessing all of the models, the group found that each had their own benefits and drawbacks. For example, the EPA HRS model was too complicated to effectively communicate to interested parties, but some of the exposure pathway calculations were very useful. Therefore, the group tried to use the best parts of the other models in order to create the proposed model. The models reviewed, and the benefits and drawbacks are summarized in Table 1.

The most common drawback in the models was the regional specificity of the assumptions upon which the models were based. Most were developed for the heavily industrialized Northeast corridor of the United States with frequent rainfall and shallow aquifers. The working group tried to keep to the criteria outlined above in II.A., and was mindful of the geographic differences of the models.

Operating concurrently with the creation of this proposed model is an independent study mandated by HB2114 conducted by Clean Sites West. In that study, which is scheduled to be completed by November 1, 1996, Clean Sites will rank the existing WQARF sites by relative risk. The Site Prioritization Subcommittee is aware of this study and will review the consultant's work when it becomes available at the direction of the Ground Water Cleanup Task Force. However, because of the timing of the study and the Task Force's request to create a model independently, the subcommittee proceeded with the creation of the proposed model.

TABLE 1
SITE PRIORITIZATION MODELS REVIEWED BY WORKING GROUP

ENTITY	MODEL	SUMMARY	BENEFITS	NEGATIVES
USEPA	CERCLA - Hazard Ranking System	Uses the square root of the sum of the squares of four exposure pathways. A score greater than 28.5 makes a site eligible for inclusion on the NPL.	Sound science in determining effects of exposure for different pathways. Sensitive to magnitude of exposure.	Too complex to communicate to interested parties. Score for NPL appears to be arbitrary cutoff. No allowance for environmental damage. Cannot use intermittent water bodies. Requires significant training for personnel to implement. Expensive to government and regulated parties to implement.
Dept. of Defense	Relative Risk Site Evaluation Framework	Uses contaminant hazard, migration pathway, and receptor factors to rank sites for annual funding.	Defensible, relatively simple ranking system. Takes into account public interest in land development. Sites are well characterized.	Non-health risk factors may pre-empt health risk factors. Cap on investigatory spending does not account for new sites. Some sites get no attention simply based on exhaustion of money.

ADEQ	LUST - Priority Ranking	Uses mobility of contaminant and potential exposure pathways. Allows for addressing of immediate response actions.	Easy to use. Deals with immediate, quick responses. Sites are constantly re-ranked.	Too specific for WQARF sites (i.e., LUST sites usually have a discernable, single release point, which usually involves petroleum). Does not address actual receptors.
ADEQ	WQARF - Eligibility and Evaluation Form	Uses contaminant release information and minor elements of exposure.	Relatively simple. Some questions directly applicable and incorporated into proposed model. Less data needed to score site. Scoring is not labor intensive. Good at identifying areas of concern.	Some scoring options were too subjective. Some questions were too broad. Actual exposure to contaminant not weighted highly. Overlap between questions.
Calif. EPA	Priority Setting for Cleanup of State-Funded Hazardous Substances Release Sites	Uses exposure and site specific information.	Relatively simple to use. Prioritized in addition to scoring. Used site mitigation factors in scoring.	Too vague (no technical specifics, too subjective). Relative terms such as "significant" used, but undefined.

Delaware DNREC	Hazard Ranking Model	Model uses immediate threat, contaminated media, human health and natural resources risk, and economic and social impacts to score sites.	Did not use air pathway (incorporated by other pathways).	Too weighted toward release (dwarfed rest of scoring process).
Mass. DEP	Mass. Contingency Plan - Numerical Ranking System*	Uses exposure pathways, site characteristics, land use, ecological and human populations, and mitigating factors to score sites.	Good exposure coverage with use of MCLs (Maximum Contaminant Levels). Good groundwater contamination tables and questions.	Too complex to communicate. More suited to NE industrialized corridor. Site scoring process too long. Significant personnel training required to score site.
Texas NRCC	State Superfund - Preliminary Hazard Assessment	Uses information on groundwater, surface water, soil, and air exposure pathways to score sites.	Seemed best suited for Arizona geographic and climactic conditions. Heavily weighted toward groundwater. Pathway specific.	Divided score for toxicity of contaminant and persistence within pathways. Did not include all factors which subcommittee agreed should be included.

*Interim Final Draft

C. Proposed Model Technical Criteria

After reviewing numerous other state and federal models, the subcommittee decided to base the proposed model on the existing model. Many decisions about specific factors to include in the proposed model were influenced by the other state and federal models which were reviewed. Each section of the proposed model (i.e., release event, characteristics, human exposure routes, and environmental factors) is discussed here in detail. The information and logic used at each decision point is described.

1. General Issues

The goals of the subcommittee in developing the proposed model were to achieve consistent scoring and use of the model results. To reach this goal, the model focuses on objective scoring. In addition, a guidance document should be prepared to accompany the proposed model. Issues to be addressed in the guidance document are listed at the end of this section. Although the primary objective of the proposed model is to rank sites based on risk to human health and the environment, many social and economic issues may be of concern at a site. However, most of these issues do not allow for objective and consistent decision-making. Therefore, the proposed model was divided into two sections: 1) a risk-based section, and 2) a narrative section which describes the social/economic issues pertinent to a site.

2. Scoring

The following points allocation is used in the scoring of a site with the proposed model:

I.A.	Release Event	10 points
I.B.	Site and Contaminant Characteristics	30 points
I.C.	Human Exposure Routes	65 points
I.D.	Environmental Factors	<u>15 points</u>
		Total: 120 points

The group determined that the total possible points under the proposed model was not as critical as the relative weights among the individual sections of the model. Therefore, the Site and Contaminant Characteristics section was scored so that it was given three times the weight of the Release section, but was twice as much as the Environmental Factors section. Also, because the group felt that exposure to human receptors was the most important factor, it was weighted to be at least twice as much as the Site and Contaminant Characteristics section.

The group also agreed that the total of 120 points for each site was not as important as the relative score of one WQARF site versus another. Therefore, the group decided that creating a threshold risk ranking score to determine whether a site should be addressed, such as the EPA's 28.5 threshold score for the HRS, would not be necessary. The group decided

that the use of a threshold score could hinder ADEQ's flexibility to address those WQARF sites with unique social and economic concerns, in addition to the presence of risk to human health or the environment.

a. Release Event

The first section of the proposed model addressed the release event of three media: soil, groundwater, and surface water. Each medium was addressed separately in this section and in later sections of the form. This approach allowed the proposed model to address unique situations for each media and is used in the following models: EPA HRS, ADEQ LUST Priority Ranking, DoD Relative Risk Site Evaluation Framework, Texas State Superfund Preliminary Hazard Assessment, Delaware Hazard Ranking Model, and Massachusetts Contingency Plan Draft Numerical Ranking System. Releases or impacts to multiple media scored higher than those sites with single media releases.

Releases to air were not addressed separately in the proposed model. However, it did allow for the addition of another medium such as air at a later time. Releases to air were not addressed directly for two reasons: 1) the presence of contamination in air in most cases was due to releases from soil or surface water and therefore would be addressed indirectly in the proposed model through the evaluation of potential migration, and 2) any other source of air contamination would be regulated under an applicable air permitting authority. Air was not included in the DoD, Delaware, or California models, but is included in the EPA HRS, ADEQ LUST, Texas, and Massachusetts models.

Another medium not addressed separately in the model was sediment. Uncertainty existed about whether to evaluate sediment as a soil or surface water release. In some cases, aquatic organisms ingest contaminants in the sediments and such exposure might be more appropriately addressed with surface water. However, sediments can be carried onto floodplains during flood events and for ephemeral streams; the stream beds are dry most of the year. Thus, in these instances the sediment is more like soil as far as exposure. The sediment issue will be addressed in greater detail in the guidance document for the proposed model.

The Texas model addressed each medium separately and divided known and unknown releases. This use was considered appropriate for the form proposed here. *Suspected* releases were addressed under *unknown* releases. Attribution was not necessary for scoring of a release. In the event a release cannot be attributed to a site, then a release was scored for the project area. More detail regarding releases and attribution will be developed in the guidance document.

Overall scoring in the proposed model was weighted more for groundwater release sites than for soils or surface water. A total of 10 points for the release event section was therefore divided up with groundwater releases scoring one point higher than soil or surface water

releases. This decision was based upon two points: 1) contaminants present in groundwater were generally more persistent than when present in surface water, and 2) exposure from contaminants in drinking water supplies would be through domestic use inside homes and buildings and irrigation use, whereas exposure from soil would be primarily outside of homes and buildings. These factors, when taken together, indicated that groundwater would pose a greater risk to human health than surface water or soil.

b. Site and Contaminant Characteristics

The characteristics section of the proposed model addressed contaminant specific characteristics (i.e., toxicity, mobility, extent, persistence, bioaccumulation) and site specific characteristics (i.e., depth to groundwater, distance to surface water, soil type, etc.). Contaminant specific characteristics included in the proposed model were a combination of those already addressed in the current model and characteristics included in the Texas model. The points available for contaminant and site specific characteristics were equal in this section.

i. Contaminant Characteristics

A toxicity ratio was used in the proposed form to address chemical toxicity, which the group considered the highest priority. Such a ratio was similar to that used in the DoD model. The toxicity ratio compared chemical concentrations found in the media of concern to the Health-Based Guidance Levels (HBGLs) for the respective media. HBGLs for soil were used due to their incorporation into rule. Comparison of observed concentrations to drinking water HBGLs as opposed to Maximum Contaminant Levels (MCLs) focused the evaluation on human health. Using HBGLs for all media also provided consistency. Therefore, of the 15 points available for this sub-section, 5 points were available for the toxicity ratio. Extent, mobility, persistence, and bioaccumulation each have one less point available sequentially (i.e., extent, 4 points; mobility, 3 points; persistence, 2 points; and bioaccumulation, 1 point). Again in this section, more points were obtained for multi-media contamination. In addition, additive effects from multiple contaminants were addressed.

To address the volume of contaminated media, the extent of contamination section was retained from the current model. However, the point values were changed to achieve a total potential score of 4 points. Mobility was addressed by comparison to minimum groundwater protection levels (GPLs). GPLs indicated the potential for migration of contaminants from soils to groundwater. Persistence addressed the same issue as the longevity question in the current model. The new categories for persistence were taken from the Texas model and included the contaminant types most often seen at sites in Arizona. Other options considered for the evaluation of persistence included using half-life, however, half-life data were difficult to obtain. In addition, half-life was specific to biodegradation and did not usually contain degradation via other processes (e.g., hydrolysis, oxidation, etc.). In order to address

bioaccumulation, values in the Federal HRS were used. Using a bioaccumulation value of 50 gave points for contaminants with bioaccumulation potentials greater than that of lead.

ii. Site Characteristics

This section addressed the migration potential of contamination due to site-specific characteristics. In this section, groundwater was given twice as many points as surface water. Ten points were assigned for groundwater and five points for surface water.

To evaluate the potential for the contaminant to migrate to groundwater, the DRASTIC score from the county DRASTIC map was used. The pesticide DRASTIC map was used if onsite pesticide concentrations exceeded the HBGL. Otherwise, the general DRASTIC map was used. If a county DRASTIC map was unavailable for the site, a pseudo-DRASTIC score was calculated using the same assumptions as those used to develop the maps. This method was identical to that used in the ADEQ LUST model.

The other factors included in this section were taken from the EPA HRS. Depth to groundwater was also included in the current model, ADEQ LUST, Massachusetts, and Texas models. If groundwater was known to be contaminated, the maximum amount of points were scored. Other factors also included points for groundwater discharging to surface water and groundwater wells pumped to surface water.

Other site-specific characteristics considered included the potential for contamination to migrate from soil to surface water. The factors considered include slope, distance, flood frequency, and groundwater recharge. These factors were taken from the current model. The group considered slope and distance to be the most influential factors; therefore these two factors received the majority of the points. The group agreed that areas of active groundwater recharge should include perennial streams, unlined canals, and recharging ponds. However, ephemeral streams and dry ponds should not be included. In addition, flooding could move contaminated soils to previously uncontaminated areas. Therefore, a site would score points for flood frequency if it was located in the 100-year floodplain.

c. Human Exposure Routes

Human exposure via all three media is addressed in this section. For each medium, the scoring focused on the presence of contamination and the size of the population affected. This section also assigned groundwater twice as many points as either surface water or soil.

i. Groundwater

Groundwater was broken down into four categories: drinking water wells actual contamination (15 points), drinking water wells potential contamination (5 points), impacted

production wells (5 points), and primary source of drinking water/no alternate drinking water supply (5 points). Drinking water wells actual contamination was scored only if a release to groundwater was scored in the release event section of the proposed model. Points were then assigned to actual contamination based upon the population served. This section was based on the Massachusetts model. An additional 5 points is available if the drinking water well contamination is above an MCL. Drinking water well potential contamination may be scored if there were a release or threat of release to groundwater. For ease of determination, the term "potential contamination" was translated into drinking wells within a specified distance. The concept of actual and potential categories was borrowed from the EPA HRS. For groundwater, the term "population served" included all people receiving water from either public water supply wells or private wells.

Impacted production wells included wells for all uses. These wells were scored whether they were closed due to contamination or still in operation. This scoring indirectly provided points for the water resource, and also ensured that sites in need of remediation would not lose eligibility for funding only because a well had been closed. At this time, no end use water quality standards have been proposed for groundwater, but in anticipation of the Task Force creating these standards, the group decided that the model should be flexible enough to incorporate these standards when they become available. Additional points were given to areas where alternative sources of drinking water were unavailable or the groundwater was the primary source of drinking water. This category was also used in the Massachusetts model.

ii. Surface Water

Surface water was broken down into three categories: actual contamination of drinking water (12 points), potential contamination of drinking water (3 points), and uses of surface water (5 points). Actual contamination could be scored only if a release to surface water were scored in the release event section of the proposed model. Points were then assigned to actual contamination based upon the population served. This section was also based on the Massachusetts model. An additional 5 points is available if the drinking water contamination is above an MCL. Potential contamination would be scored if there were a release or threat of release to surface water. For ease of determination, potential contamination was assumed to be drinking water intakes within a specified distance. The concept of actual and potential categories was borrowed from the EPA HRS.

For surface water, the term "population served" included all people receiving water from either public or private intakes. Uses of surface water were included by categorizing the surface water using state designations for surface water bodies and considering other risk factors. This was the approach used in the current model.

iii. Soil

Soil was broken down into three categories: population affected (5 points), sensitive receptors (5 points), and accessibility (5 points). These categories were based on the Texas model and the EPA HRS. Actual contamination could be scored only if a release to soil were scored in the release event section of the proposed model. In addition, soil contamination must be present in the upper two feet of soil in order to receive a score under this section. Potential exposure of the nearby population to contaminated soil depended upon the distance of receptors and accessibility of the soil. Population affected was given more points for contaminated soil in a more populated area. Soil accessibility was reduced by cover (e.g., pavement, concrete, contamination at depth) and fencing. Therefore, more points were given for highly accessible sites. Additional points were scored for soil contamination with sensitive receptors in close proximity. Sensitive receptors were defined as schools, day cares, hospitals, nursing homes, and resident children.

Two soil options were developed to evaluate soil exposures. The second option only included two soil categories: population affected (10 points) and sensitive receptors (5 points). The second option used two tables: one that included population, distance, and accessibility; and a second table that included sensitive receptors, distance, and accessibility. The first option was simpler and the separate categories allowed easier interpretation of the scores. The difference in scores between the two options were 0 to 2 points in most cases. The group agreed that this difference was insignificant. Therefore, although neither option has been selected, option 1 is preferred.

d. Environmental Factors

The environmental factors section evaluated risks of contamination to ecological and other environmental receptors. Environmental factors included ecological receptors (9 points), recreational resources (3 points), and cultural resources (3 points). Contamination present in such areas was considered to result in an added burden to society and the environment and therefore warranted additional points to prioritize cleanup. The most comprehensive list of ecological receptors was the list in the EPA HRS. This list, modified to be more sensitive to conditions in Arizona, was used in the proposed model. The terms in the table will be defined in the guidance document. Recreational resources included parks, campgrounds, and other areas used for public recreation such as trails and golf courses. Cultural resources included historical sites, burial grounds, archaeological sites, other states, and tribal lands.

3. Guidance for Use of Proposed Model

To ensure objective and consistent use of the model, a guidance document will be prepared. The following is a preliminary list of issues to be discussed in the guidance document:

I.A. Release Event

- Criteria for usability of analytical data (groundwater, surface water, soil, soil vapor, and lysimeter data)
- Definitions of "site", "known release", "unknown release", "no release", "attribution", and "contaminants".
- Relevance of attribution.

I.B. Site and Contaminant Characteristics

I.B.1.a. Contaminant Hazard

- Discussion of data to be used in this calculation.
- Guidance on when R values can be added together.

I.B.1.c Mobility

- Reference to the Leachability Guidance Document for determining GPLs.

I.B.2.a.i. DRASTIC Maps

- Guidance on when the Pesticide DRASTIC Map will be used and when the General DRASTIC Map will be used.

I.B.2.a.ii. Other Factors

- Definition of "groundwater discharging to surface water".
- Criteria for determining the depth from contamination to groundwater.

I.B.2.b.i. Slope/Distance

- Guidance on usage of maps for slope and distance determinations.

I.B.2.b.ii. Flood Frequency

- Guidance on usage of FEMA Maps to determine the extent of the 100-year floodplain.

I.B.2.b.iii. Groundwater Recharge

- Criteria for determining "area of active groundwater recharge".

I.C. Human Exposure Routes

I.C.1. Groundwater

- Criteria for calculating the population served by groundwater.
- Criteria for determining if a production well has been "impacted".
- Definition of "primary source of drinking water".

I.C.2. Surface Water

- Criteria for calculating the population served by surface water.
- Criteria for use of sediment data.
- Criteria for determining uses of surface water.

I.C.3. Soil

- Definition of "sensitive receptors", "institutional controls", "adjacent to the site", "accessible", and "inaccessible".

I.D. Environmental Factors

I.D.1. Ecological Factors

- Definitions of terms used in the table.
- Definitions of "recreational uses", and "cultural resources".

I.D.2. Recreational Uses

- Definition of "recreational uses".
- Determination of appropriate distance from the site.

I.D.3. Cultural Resources

- Definition of "cultural resources".
- Determination of appropriate distance from the site.

D. Social and Economic Factors

While the quantifiable risk must be assessed for purposes of ranking a site for WQARF funding, the group also decided that there were other factors that must be weighed when making a final priority determination. The group agreed that these social and economic factors could not be quantified with any reasonable certainty, but should be reported in the final ranking. The factors could be used to aid in the WQARF funding allocation process. The factors would not change the score of the site. The group created the following list of factors:

- Responsible Parties
- Diminution of Property Value
- Brownfields Development
- Environmental Justice
- Remediation Feasibility
- Cost Effectiveness and No Action Cost
- Possible End Uses (Probability of Restoration)
- Loss of Business
- Loss of Resources
- Previous Agreements

- Already Initiated Remediation (Ongoing Remediation)
- Time/Schedule for Remediation
- Project Management Issues
- Data Availability
- Data Confidence
- Other Factors

The exact process for determining which factors are to be included for each site should be defined in the guidance document. However, the group envisions a process where ADEQ knowledge and public participation would both contribute to the completion of the list of factors for a site.

III. SITE RANKING LIST

A. Introduction

Current WQARF priority list sites were scored using the proposed model in order to determine whether the methodology scored sites as intended, and to determine which components of the method were the most sensitive. In order to accomplish this, each WQARF priority list site was scored. *The preliminary scores presented here were developed strictly for evaluating the proposed quantitative scoring form. These provisional results are not official scores or rankings and should not be interpreted as such.*

B. Methods

Four methods were used to analyze the scoring results using the proposed model. First, WQARF priority list sites were scored and ranked from highest to lowest score. Second, the scores using the proposed form were compared to scores given to these sites by the ADEQ using the current model. Third, a sensitivity analysis that examined the variance in scoring in each of the categories in the proposed form (i.e., release event, site and contaminant specific characteristics, human exposure, and environmental) was conducted. Finally, total points using the proposed model were separated into the four scoring categories noted above.

C. Results

Figures 1 through 5 display the results of the analyses that were conducted. Figure 1 presents the scores developed previously by ADEQ using the current model and the scores developed by the group using the proposed model. Sites are ranked in descending order using the proposed scoring form. This table compares the quantitative and relative changes in scoring between the methods. Figure 2 provides a graphical depiction of the relative scores for each site using both of the scoring methods. Figures 3 and 4 provide a graphical representation of the

sensitivity of the proposed scoring form and allows the viewer to determine which of the categories have the most influence on the relative ranking of the sites. Figure 5 breaks out the aggregate point distribution for each of the four scoring categories.

D. Discussion

Overall, there is little correlation between the relative ranking of each of the sites using the current and proposed models. There are considerable changes in the relative ranking for many of the sites. Figures 1 through 4 show the individual differences for any given WQARF priority list site.

While some variability exists in the Release Event, Site and Contaminant Specific Characteristics, and Environmental Factors sections, Figures 3 and 4 indicate that the differences in the relative ranking of sites using the proposed depend largely on the magnitude of points acquired in the Human Exposure section. This result is in accordance with the objective of the proposed model that human exposure be the dominant criteria for establishing relative ranking of the sites.

Sites with the highest scores are generally those with human exposures in multiple media. Sites such as these generally have exposures via groundwater, and either surface water or soil, or both. However, while the proposed model is quite sensitive to human exposure, it is less sensitive to the magnitude of the exposure (i.e., dose sensitivity). The group has explored methods that would make the model more sensitive to dose. However, the group agreed that the benefits of the alternative models that were used were outweighed by the disadvantages presented by the alternative methods. After reviewing the results of scoring the current WQARF priority list sites, the subcommittee believes that we have developed an appropriate model for quantitatively evaluating WQARF sites that is protective of human health and the environment.

Site References Figure 1

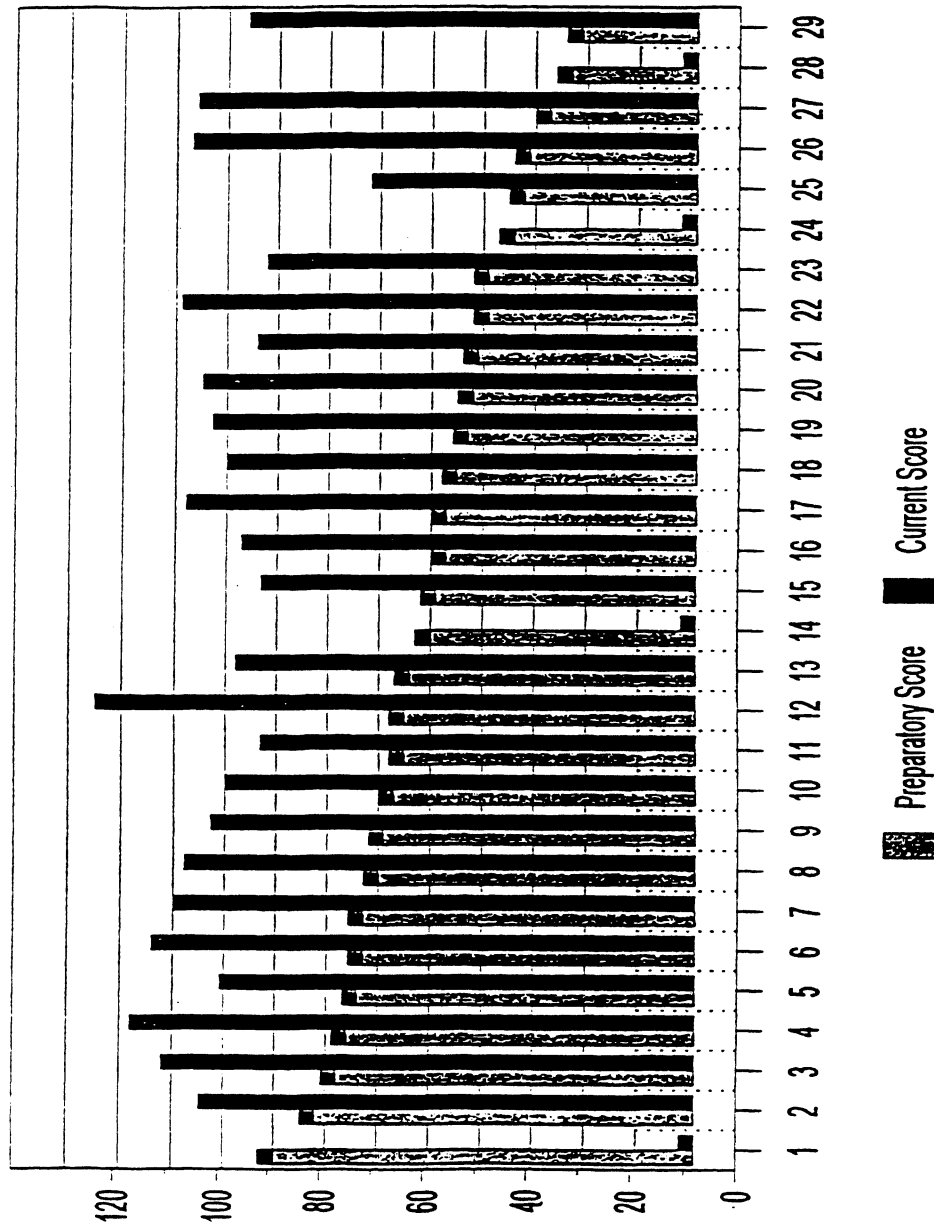
Scores Using Proposed Eligibility and Evaluation Form

Current E & E Rank	Preparatory Rank	Site Name	Release Event	Contaminant & Site Characteristics	Human Exposure Routes	Environmental Factors	Total Score
n/a	1	Rural multi-media with exposure	10	28	28	16	61
12	2	Urban multi-media site	7	26	34	6	73
4	3	Rural multi-media with exposure	8	24	31	6	69
2	4	Urban multi-media site	7	22	38	0	67
15	5	Urban multi-media site	8	28	28	3	65
6	6	Urban Landfill	8	28	24	6	64
3	7	Urban multi-media site	8	24	32	0	64
7	8	Urban multi-media site	8	23	27	3	61
13	9*	Urban Superfund site, multimedia	8	22	24	6	60
16	10	Urban/rural multi-media site	8	22	25	3	58
1	11	Urban/rural multi-media site	7	24	25	0	58
21	12	Contaminated private/public wells	7	18	24	6	56
18	13	Urban multi-media site	8	23	21	3	55
n/a	14	Contaminated public wells	10	25	10	6	51
22	15	Urban Landfill	8	27	15	0	50
8	16	Rural pesticides in groundwater	8	23	14	3	48
19	17	Urban groundwater site	5	20	20	3	48
17	18	Remedial fluff dump	3	23	20	0	48
14	19	Urban Landfill	8	23	10	3	44
11	20	Urban groundwater contamination	7	20	13	3	43
23	21	Urban groundwater contamination	5	21	10	6	42
6	22	Urban groundwater contamination	8	22	7	3	40
24	23	Urban groundwater contamination	7	23	10	0	40
n/a	24*	Urban pesticides in soil	6	18	11	0	35
25	25	Rural soil/groundwater contamination	7	20	6	0	33
9	26	Urban dross site	3	11	15	3	32
10	27	Rural Landfill	7	17	4	0	28
n/a	28	Rural multi-media with exposure	3	8	13	0	24
20	29	Rural soil contamination	3	13	6	0	22

* Federal Project

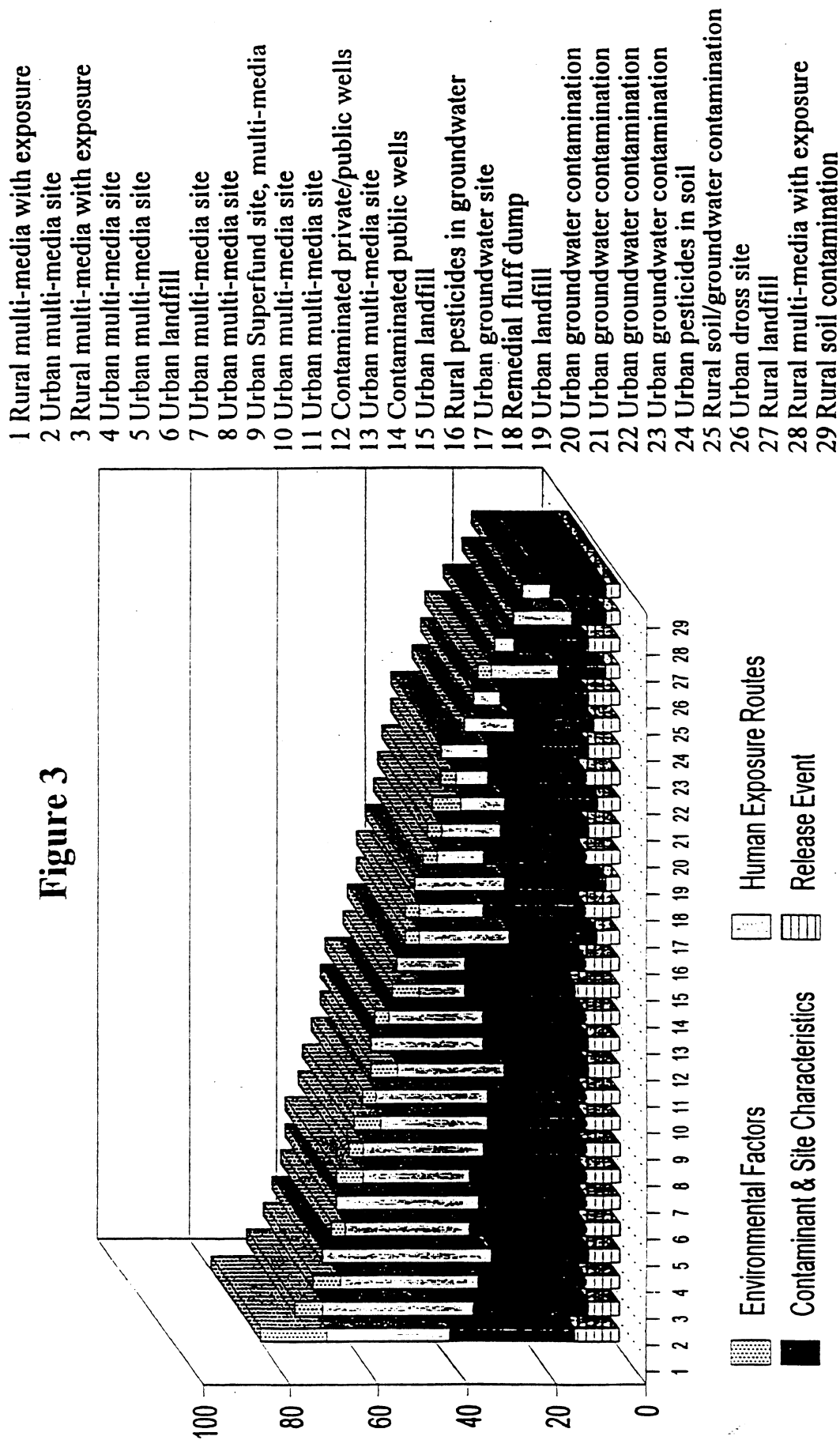
SCORING COMPARISON

Figure 2



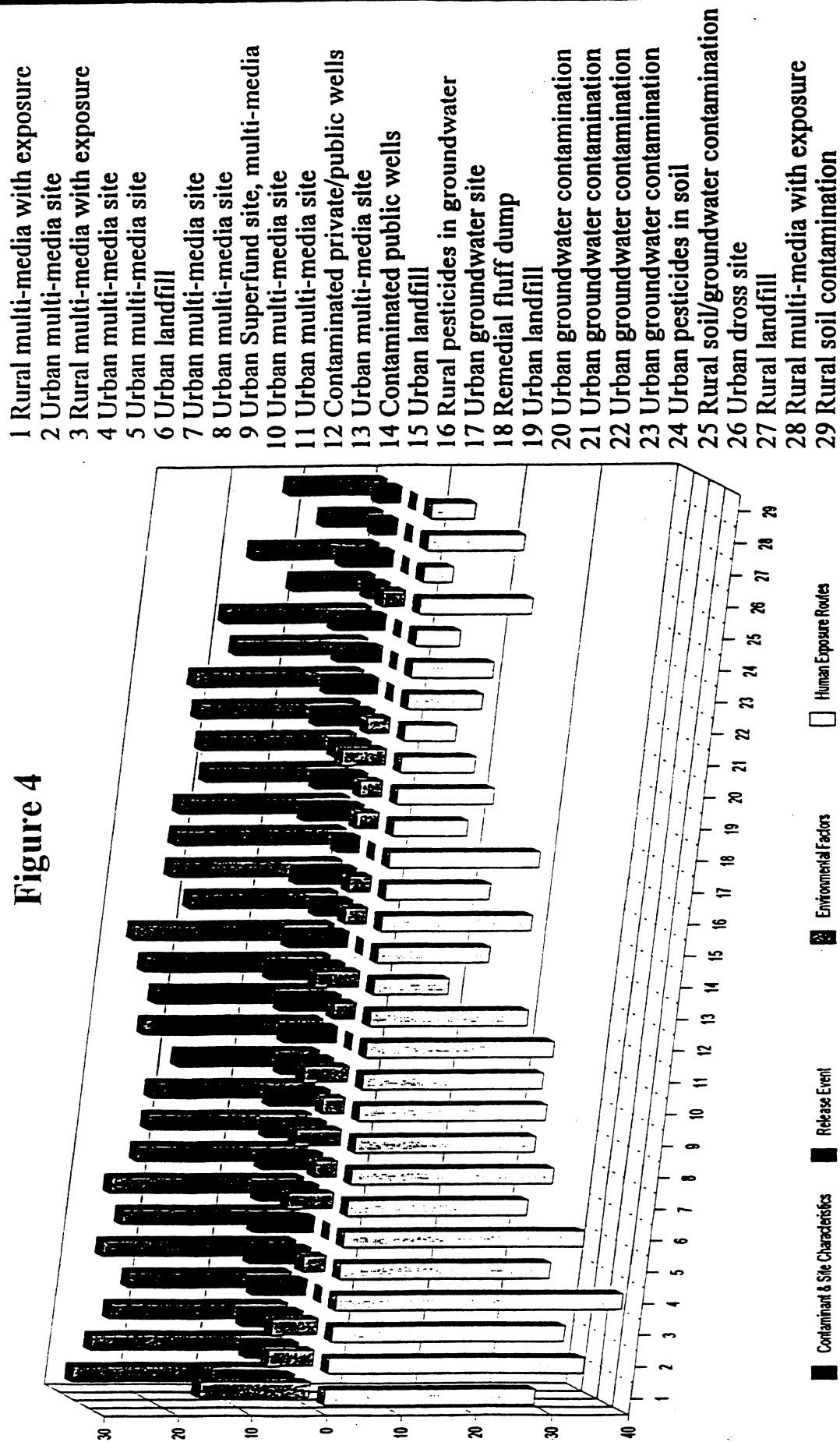
PREPARATORY SITE SCORING EVALUATION

Figure 3



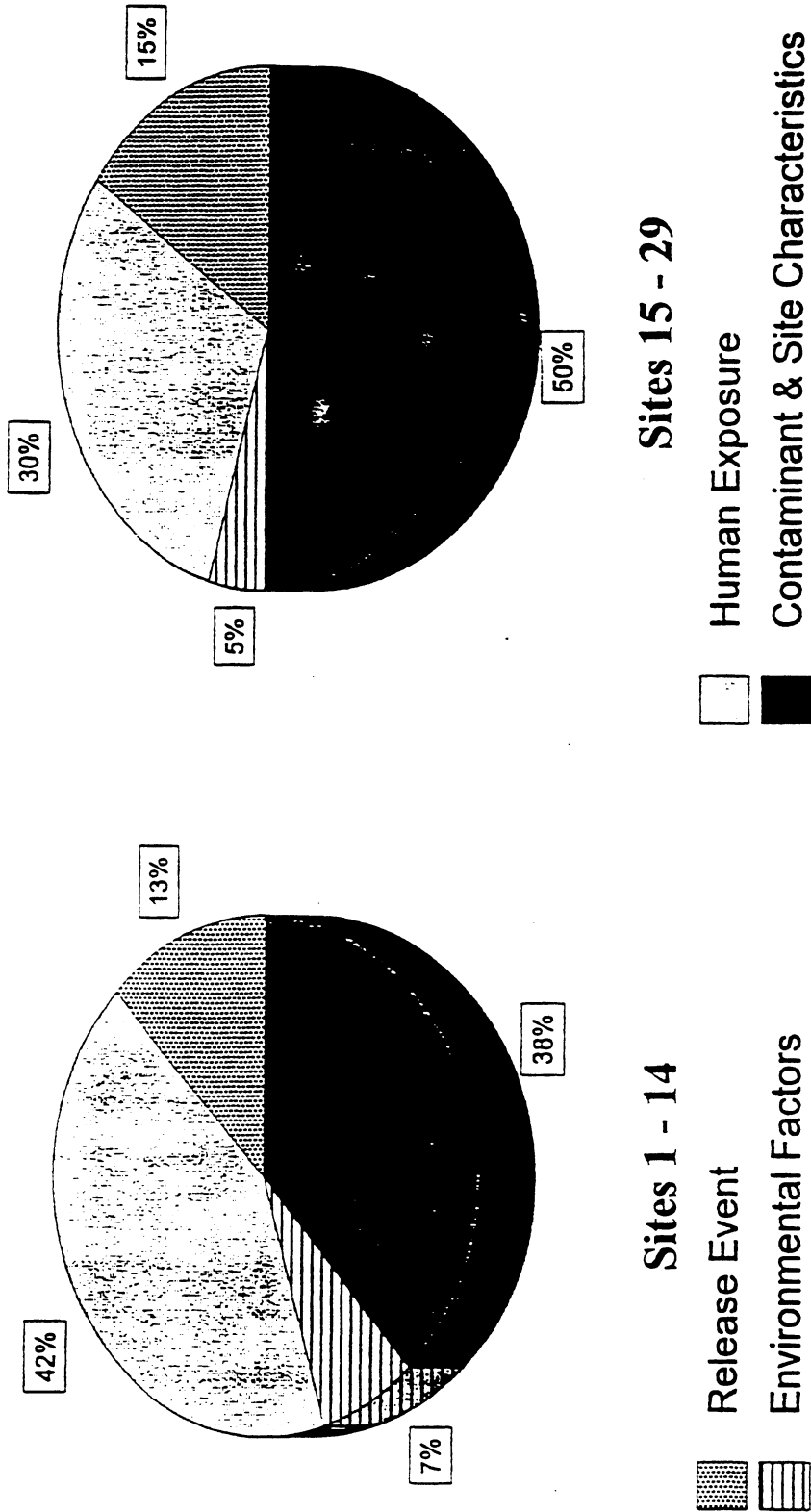
CATEGORY COMPARISON

Figure 4



TOTALS BY PERCENTAGE

Figure 5



IV. REQUIRED STATUTORY AND REGULATORY CHANGES FOR IMPLEMENTATION OF PROPOSED MODEL

A. Amendments to Arizona Revised Statutes Title 49

1. WQARF Authority to Remediate Sites Which Threaten Public Health

On August 8, 1996, the Task Force approved the Subcommittee's recommendation that a site should be eligible for prioritization and funding for remediation even if it does not affect or threaten the waters of the state but does pose a threat to human health. The Task Force determined that these sites should be prioritized in the same manner as all other sites. The WQARF statutes would need to be amended to clarify this authority.

2. Administrative Appeals

On August 8, 1996, the Task Force approved the Subcommittee's recommendation that the ADEQ Director should have the final decision-making authority on prioritization issues with no administrative appeal. Thus, ADEQ's actions regarding the WQARF site scoring process, site prioritization process, and WQARF site priority listing process should not be subject to administrative appeal pursuant to A.R.S. § 49-298 or A.R.S. Title 41, Chapter 6, Article 10 (Office of Administrative Hearings). The WQARF statutes would need to be amended accordingly.

The Task Force also agreed that ADEQ would reconsider site scoring decisions upon request and receipt of additional information regarding the site and to respond in writing to the requester addressing the additional information. The Director's decisions made pursuant to this process fall within the agreed-upon exemption and are not appealable agency actions.

B. Amendments to Arizona Administrative Code Title 18

A.A.C. R18-7-104 requires ADEQ to use the current model; this rule would need to be amended to incorporate the proposed model.

V. CONCLUSION

The Site Prioritization Subcommittee of the Groundwater Cleanup Task Force recommends that the attached proposed model be adopted for use in prioritizing WQARF sites. Upon review of various federal and state risk and prioritization models, the subcommittee regards the revised model as being protective of human health and the environment for the State of Arizona. The proposed model incorporates both quantitative risk factors and qualitative economic and social factors for prioritization. The subcommittee is also

recommending amending the WQARF statute in order to include sites that affect human health but do not affect or threaten waters of the State, and for exempting site prioritization decision from administrative appeals. At a minimum, Title 18 of the Arizona Administrative Code would have to be amended to incorporate the proposed model by reference.

The Site Prioritization Subcommittee thanks the Groundwater Cleanup Task Force for the opportunity to develop the proposed model.

VI. ACKNOWLEDGMENTS

The following individuals have participated in the creation of the proposed model and the preparation of this final report, and their dedication is greatly appreciated:

Member	Employer
Martin Barackman	Hughes/Dept. of Defense
Lowell Carty**	ADEQ - WQARF
Ethel DeMarr*	ADEQ - Waste Programs Division
Jon Fiegen	Attorney General's Office
Scott Goodwin	ADEQ - WQARF
Hannah Goldstein	Scottsdale Concerned Citizens
Mary Hessler	ADEQ - WQARF
Will Humble	ADHS
Phil Lagas*	Basin & Range
Dave Laney	Dames & Moore
Martha Morrill	ADEQ - UST
Rich Petrus	Roy F. Weston
Jim Vieregg	Quarles & Brady
Jessica Youle	Salt River Project
David Young	Kane Jordan von Oppenfeld Bischoff & Biskind
* Site Prioritization Subcommittee Co-Chair	** Site Prioritization Model Working Group Chair

Additionally, the subcommittee wishes to thank the following people who gave presentations on their site prioritization models and answered all of the strawman questions:

Jeff Kulon	ADEQ - WQARF Eligibility & Evaluation Model
Karen Oden	US Dept. of Defense Relative Risk Site Evaluation Frame Work
Dan Opalski	US EPA Region IX Hazard Ranking System
Quinn Thacker	ADEQ - Arizona LUST Priority Ranking

Finally, the subcommittee would like to thank the following state agencies for making their models available for review:

California Environmental Protection Agency (Greg Holmes)
Delaware Department of Natural Resources and Environmental Control (Karl Kalbacher, Kurt Olinger)
Kansas Department of Health and Environment (Rick Bean)
Massachusetts Department of Environmental Protection (Mike Reed, Helen Waldorf)
Texas Natural Resource Conservation Commission (Wesley Newberry)
ASTSWMO (Randy Crockett)

APPENDIX:

GROUNDWATER CLEANUP TASK FORCE
SITE PRIORITIZATION SUBCOMMITTEE

PROPOSED WQARF ELIGIBILITY & EVALUATION MODEL

Dated October 3, 1996

DRAFT

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY ASSURANCE REVOLVING FUND

REVISED ELIGIBILITY AND EVALUATION FORM

OCTOBER 2, 1996

EMERGENCY ACTION INFORMATION

SITE NAME: _____

EMERGENCY: _____ YES _____ NO

DESCRIPTION: _____

FACILITY INFORMATION

SITE NAME: _____

SITE ADDRESS: _____

SITE CONTACT: _____

ADDRESS: _____

COUNTY: _____ LAT/LONG: _____

OWNER: _____ OPERATOR: _____

ADDRESS: _____ ADDRESS: _____

SCORING INFORMATION

A. RELEASE EVENT (10 pts) _____

B. SITE AND CONTAMINANT CHARACTERISTICS (30 pts) _____

C. HUMAN EXPOSURE ROUTES (65 pts) _____

D. ENVIRONMENTAL FACTORS (15 pts) _____

TOTAL SCORE _____

NOTE: GUIDANCE WILL BE DEVELOPED FOR COMPLETING THIS FORM

I. SCORING SUMMARY

A. RELEASE EVENT (10 pts)	_____
1. SOIL (3 pts)	_____
2. GROUNDWATER (4 pts)	_____
3. SURFACE WATER (3 pts)	_____
 B. SITE AND CONTAMINANT CHARACTERISTICS (30 pts)	_____
1. CONTAMINANT SPECIFIC (15 pts)	_____
a. Contaminant Hazard (5 pts)	_____
b. Extent of Contamination (4 pts)	_____
c. Mobility (3 pts)	_____
d. Persistence (2 pts)	_____
e. Bioaccumulation (1 pt)	_____
 2. SITE SPECIFIC (15 pts)	_____
a. Groundwater (10 pts)	_____
i. DRASTIC Maps (5 pts)	_____
ii. Other Factors (5 pts)	_____
b. Surface Water (5 pts)	_____
i. Slope/Distance (3 pts)	_____
ii. Flood Frequency (1 pt)	_____
iii. Groundwater Recharge (1 pt)	_____
 C. HUMAN EXPOSURE ROUTES (65 pts)	_____
1. GROUNDWATER (30 pts)	_____
a. Drinking Water Wells Affected (20 pts)	_____
i. Actual - Population (10 pts)	_____
ii. Actual - Standards (5 pts)	_____
iii. Potential - Population (5 pts)	_____
b. Impacted Production Wells (5 pts)	_____
c. Primary Source of Drinking Water/ No Alternative Water Supply (5 pts)	_____
 2. SURFACE WATER (20 pts)	_____
a. Population Affected (15 pts)	_____
i. Actual - Population (7 pts)	_____
ii. Actual - Standards (5 pts)	_____
iii. Potential - Population (3 pts)	_____
b. Uses of Surface Water (5 pts)	_____
 3. SOIL (15 pts)	_____
a. Population (5 pts)	_____
b. Accessibility (5 pts)	_____
c. Sensitive Receptors (5 pts)	_____
 D. ENVIRONMENTAL FACTORS (15 pts)	_____
1. ECOLOGICAL FACTORS (9 pts)	_____
2. RECREATIONAL USES (3 pts)	_____
3. CULTURAL RESOURCES (3 pts)	_____
Potential total points	_____

A. RELEASE EVENT (10 pts)

If contaminants are present in the groundwater, surface water, or soil, score a known release to the appropriate media. If there is no release to groundwater, surface water, or soil, the remainder of the form should not be completed.

1. SOIL (3 pts)

Please use the following table:

Type of Release	Soil Score
Known	3
Unknown	1
None	0

_____ Total Soil Score (A.1.)

2. GROUNDWATER (4 pts)

Type of Release	Groundwater Score
Known	4
Unknown	2
None	0

_____ Total Groundwater Score (A.2.)

3. SURFACE WATER (3 pts)

Type of Release	Surface Water Score
Known	3
Unknown	1
None	0

_____ Total Surface Water Score (A.3.)

===== **Total Release Event Score (A.1. + A.2. + A.3.)**

B. SITE AND CONTAMINANT CHARACTERISTICS (30 pts)

1. CONTAMINANT SPECIFIC (15 pts)

a. Contaminant Hazard

Contaminant hazard is the ratio (R) of the contaminant concentration to the benchmark for the substance. For groundwater:

$$R = C/\text{Drinking Water HBGL}$$

For Surface Water:

$$R = C/\text{Drinking Water HBGL}$$

For Soil:

$$R = C/\text{Residential HBGL}$$

Determine a score for each of the three media as follows: First, determine the highest possible value of R for each substance; then add the R values together. Then add together the R values for the three media (groundwater, surface water, and soil). Finally, choose the highest score from the following table:

R	Score
R < 1	0
1 < R < 10	1
10 < R < 100	2
100 < R < 1,000	3
1,000 < R < 10,000	4
10,000 < R	5

b. Extent of Contamination

What is the extent of release of the hazardous substance? Use the quantity that yields the highest score. Please use the following table:

	Criteria			Score
Volume of Soil (cu. yds.)	Ground-water (wells)	Rivers/Streams (miles)	Lakes (ac. of surface)	
> 1,000	> 15	> 1.0	> 100	4
101 - 1,000	10 - 15	0.5 - 1.0	26 - 100	3
10 - 100	5 - 9	0.2 - 0.5	5 - 25	2
< 10	1 - 4	< 0.2	< 5	1
Unknown	Unknown	Unknown	Unknown	0
*Production wells only				

c. Mobility

The Groundwater Protection Levels (GPLs) are used as a measure of mobility, and onsite soil concentrations ^o will be compared to the GPL. If site-specific data is available, then the GPL will be calculated using the ADEQ model. If site-specific data is not available, then the minimum GPL will be used. Choose the highest score from the following table:

<u>Criteria</u>	<u>Score</u>
Groundwater Contamination at the Site	3
C > Site Specific GPL	2
C > Minimum GPL	1
C < Minimum GPL	0
No GPL Available	0

d. Persistence

Persistence is determined by the type of contaminant. Please choose the highest score from the following table:

<u>Criteria</u>	<u>Score</u>
Metals, Polycyclic Compounds, and Halogenated Hydrocarbons	2
Straight Chain Hydrocarbons, Substituted Ring Compounds, and Other Ring Compounds	1
Easily Biodegradable Compounds	0

e. Bioaccumulation

Look up the Food Chain Bioaccumulation value in the Superfund Chemical Data Matrix (SCDM). Please use the following table:

<u>Criteria</u>	<u>Score</u>
Bioaccumulation Value > 50	1
Bioaccumulation Value ≤ 50	0

Total Contaminant Specific Score (B.1.)
(B.1.a + B.1.b. + B.1.c. + B.1.d. + B.1.e.)

2. SITE SPECIFIC (15 pts)
a. Groundwater (10 pts)
i. DRASTIC Maps

The DRASTIC score will be determined from the county DRASTIC map. If pesticides are of concern at the site, use the Pesticide DRASTIC map; otherwise, use the General DRASTIC map. If no DRASTIC map is available, the attached instructions will be used to generate a pseudo-DRASTIC score. The score will be evaluated according to the following table:

Criteria	Score
200 ≤ DRASTIC Score	5
160 ≤ DRASTIC Score ≤ 199	4
120 ≤ DRASTIC Score ≤ 159	3
80 ≤ DRASTIC Score ≤ 119	2
DRASTIC Score ≤ 79	1

ii. Other Factors

Other factors include depth from the bottom of contamination to groundwater and the groundwater to surface water flow. Please choose the highest score from the following table:

Criteria		Score
Depth from Contamination to Groundwater (feet)	0	5
	1- 25	4
	26-100	3
	101-300	2
	>300	1
Potential for Groundwater to Reach Surface Water	Groundwater Discharging to Surface Water	2
	Groundwater Wells Pumped to Surface Water	1

b. Surface Water (5 pts)

i. Slope/Distance

Determine the average slope between the site and surface water, and determine the distance to the nearest surface water. Use the following table to determine the slope/distance value:

Slope, %	Distance in Feet			
	0-100	101-500	501-1,000	>1,000
0 - 3	3	1	1	0
3 - 5	3	2	1	1
5 - 7	3	3	2	1
> 7	3	3	3	1

ii. Flood Frequency

Score 1 point if the site is located within the 100-year floodplain.

iii. Groundwater Recharge

Score 1 point if the site is located in an area of active groundwater recharge.

_____ Total Site Specific Score (B.2.)
(B.2.a.i. + B.2.a.ii. + B.2.b.i. + B.2.b.ii. + B.2.b.iii.)

_____ Total Site and Contaminant Characteristics Score
(B.1 + B.2)

C. HUMAN EXPOSURE ROUTES (65 pts)

1. GROUNDWATER (30 pts)

If there is no release or threat of release to groundwater, do not complete this section (I.C.1.).

a. Drinking Water Wells Affected

i. Actual Contamination - Population _____

This will be evaluated if any contamination has been detected in drinking water wells. Please choose the highest score from the following table:

Population Served by Groundwater: Actual Contamination Choose the Highest Score	
Population served by groundwater	Score
0	0
1- 25	4
25- 999	6
1,000-4,999	8
≥5,000	10

ii. Actual Contamination - Standards _____
Score 5 points if any contamination has been detected in drinking water wells at concentrations exceeding the Maximum Contaminant Levels (MCLs).

iii. Potential Contamination - Population _____
This will be evaluated if (1) contamination has not impacted any drinking water wells, but may impact them in the future or (2) contamination has impacted drinking water wells, and it may spread to other drinking water wells. Choose the highest score from the following table:

Population Served by Groundwater: Potential Contamination Choose the Highest Score				
Population Served	Distance Down gradient from Contamination			
	0- $\frac{1}{4}$ Mile	$\frac{1}{4}$ -1 Mile	1-4 Miles	>4 Miles
0	0	0	0	0
1 - 25	3	2	1	0
25 - 5,000	4	2	1	0
$\geq 5,000$	5	3	1	0

b. Impacted Production Wells

Score 5 points if contamination has been detected in any production wells, including wells closed due to contamination.

c. Primary Source of Drinking Water/

No Alternative Drinking Water Supply

Score 5 points for sites where groundwater is the primary source of drinking water or where no alternative drinking water supply is available.

_____ Total Groundwater Score (C.1.)

(C.1.a.i. + C.1.a.ii. + C.1.b. + C.1.c.)

2. SURFACE WATER (15 pts)

If there is no release or threat of release to surface water, do not complete this section (I.C.2.).

a. Drinking Water Intakes Affected

i. Actual Contamination - Population

This will be evaluated if contamination has impacted drinking water intakes. Please choose the highest score from the following table:

The End Use Subcommittee is presently developing end use water quality standards. After these standards are developed, the Site Prioritization Subcommittee may recommend that 5 additional points be made available for impacted wells in excess of the end use water quality standards. These 5 points are not presently part of the model.

Population Served by Surface Water: Actual Contamination Choose the Highest Score	
Population served by surface water	Score
0	0
1- 25	3
25- 999	5
1,000-4,999	6
≥5,000	7

- ii. Actual Contamination - Standards _____
 Score 5 points if any contaminants have been detected at the drinking water intakes at concentrations exceeding Maximum Contaminant Levels (MCLs).
- iii. Potential Contamination - Population _____
 This will be evaluated if (1) contamination has not impacted any drinking water intakes, but may impact them in the future or (2) contamination has impacted drinking water intakes and it may spread to other drinking water intakes.

Population Served by Surface Water: Potential Contamination Choose the Highest Score			
Population Served	Distance Downgradient from Contamination		
	0 - 1 Mile	1 - 15 Miles	> 15 Miles
0	0	0	0
1 - 25	2	1	0
25 - 5,000	2	1	0
≥ 5,000	3	1	0

b. Uses of Surface Water

Please choose the highest score from the following table:

<u>Criteria</u>	<u>Score</u>
Drinking water or full body contact	5
Aquatic and wildlife/warm or cold water fishery or incidental human contact	4
Agriculture or livestock watering	2
Other uses	1
Not Applicable	0

_____ Total Surface Water Score (C.2.)
 (C.2.a.i. + C.2.a.ii. + C.2.b.)

3. SOIL (15 pts)

If there is no release to soil, do not complete this section (I.C.3.). If the contaminant concentration is below the Arizona Human Health-Based Guidance Level (HBGL), score 0 for this section. If the contaminant is not present in the upper 2 feet of soil, score 0 for this section.

a. Population Affected

Please choose the highest score from the following table:

Distance from Site	Population		
	1-100	100-500	>500
0 - ½ mile	3	4	5
½ - 1 mile	0	1	2

b. Sensitive Receptors

Sensitive receptors include schools, day care, hospitals, and nursing homes. Choose the highest score from the following table:

<u>Criteria</u>	<u>Score</u>
Sensitive Receptors Onsite	5
Adjacent to the Site	4
Within ¼ Mile	3
> ¼ Mile	0

c. Accessibility

If the contaminant concentration exceeds the HBGL and is present in the upper 2 feet of soil, then choose the highest score from the following table:

<u>Criteria</u>	<u>Score</u>
No Fence or Paving	5
Non-Maintained Fence or Paving	3
Maintained Fence or Paving	1
Maintained Fence and VEMUR	0

_____ Total Soil Option 1 Score (C.3.)
(C.3.a. + C.3.b. + C.3.c.)

D. ENVIRONMENTAL FACTORS (15 pts)

1. ECOLOGICAL (9 pts)

Evaluate ecological factors for conditions onsite.
Choose the highest score from the table on the next
page.

2. RECREATIONAL (3 pts)

Score 3 points if the site is used for public
recreation.

3. CULTURAL RESOURCES (3 pts)

Score 3 points if any of the following are present
onsite:

Historical Sites
Burial Grounds
Archaeological Sites
Impacts to other States or Indian Tribal Lands

_____ **Total Environmental Factors Score (D.1.+ D.2. + D.3.)**

Ecological Factor	Score
Critical habitat ^a for Federal or State designated endangered species Critical areas identified under the Clean Lakes Program ^b National or State Park National or State Monument Designated Federal Wilderness area National Lakeshore Recreational Area	9
Special status species ^c documented as occurring in the vicinity of the site National Preserve National Forest National or State Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Spawning areas critical ^d for the maintenance of fish/shellfish species within rivers or lakes Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes in which the fish spend extended periods of time Terrestrial areas utilized for breeding by large or dense aggregations of animals National river reach designated as Recreational	6
Federal category 1 or category 2 candidate species or State candidate species documented as occurring in the vicinity of the site Federal or State designated Scenic or Wild River State land designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	3
State designated areas for protection or maintenance of aquatic life ^e	1

Notes:

^aCritical habitat as defined in 50 CFR 424.02

^bClean Lakes Program critical areas (subareas within lakes, or in some cases entire small lakes) identified by State clean Lake Plans as critical habitat (Section 314 of Clean Water Act, as amended)

^cFederal-listed endangered or threatened species, Federal-proposed endangered or threatened species, State-listed endangered or threatened species

^dLimit to areas described as being used for intense or concentrated spawning by a given species.

^eAreas designated under Section 305(a) of Clean Water Act, as amended.

II. SOCIAL/ECONOMIC FACTORS

Please attach a narrative regarding social/economic factors. The following factors should be considered:

- Responsible Parties
- Diminution of Property Value
- Brownfields Development
- Environmental Justice
- Remediation Feasibility
- Cost Effectiveness and No Action Cost
- Possible End Uses (Probability of Restoration)
- Loss of Business
- Loss of Resources
- Previous Agreements
- Already Initiated Remediation (Ongoing Remediation)
- Time/Schedule for Remediation
- California Project Management Issues
- Data Availability
- Data Confidence
- Other Factors

APPENDIX A

Instructions to Generate a Pseudo-DRASTIC Score

SECTION 2: HYDROGEOLOGIC CHARACTERISTICS OF THE UST SITE
AND SURROUNDING AREA

PAGE 3

If a DRASTIC score from a "General" DRASTIC map is available for this site, determine its value in part A below. If there is no DRASTIC score for this site, begin at part B and continue through Section 2. If there is known or probable GROUNDWATER impact, then a full 40 points will be awarded to section 2, and continue with section 3. (Note: Upon receipt of groundwater cleanup documentation, the DRASTIC score will reduce to its normal value.) Drastic maps are available for Maricopa, Pima, Santa Cruz, Yuma, Lapaz, and some portions of Pinal County.

GW IMPACT NO

DRASTIC SCORE NO

A. Drastic Score (For those counties with a Drastic Map)
Drastic Score Points Drastic Score Points

=>200.....	35	120-139.....	15
180-199.....	30	100-119.....	10
160-179.....	25	80 - 99.....	5
140-159.....	20	<79.....	1
		SCORE:	0

B. Sites without a DRASTIC score:

B1. Depth to Groundwater:

RANGE:	RATING
0 to 5 feet	10
6 to 15 feet	9
16 to 30 feet	7
31 to 50 feet	5
51 to 75 feet	3
76 to 100 feet	2
101 + feet	1
UNKNOWN	10

RATING: 0 (X5) = B1 SCORE: 0

B2. Impact of Vadose Zone Media:

Media	RANGE	RATING	JUSTIFICATION
Silt/clay	1-2	0	
Shale.....	2-5	0	
Limestone	2-7	0	
Sandstone	4-8	0	
Bedded Limestone, Sandstone, Shale	4-8	0	
Sand and Gravel with silt and clay	4-8	0	
Metamorphic / igneous.....	2-8	0	
Sand and Gravel.....	6-9	0	
Basalt.....	2-10	0	
Karst Limestone.....	8-10	0	
Unknown	10	0	

B2 SCORE (rating X 5): 0

B3: Hydraulic Conductivity of Uppermost Aquifer:

Description	POINTS
Gravel; Karst Limestone; cobbles; highly fractured rocks; or UNKNOWN K, Darcys value of $1E+3$ to $1E+5$, or K, gpd/ft 2 value of $1E+4$ to $1E+6$	30
Sands; unfractured sedimentary rocks (except shales and silstones), K, Darcys value of 1 to $1E+3$, or K, gpd/ft 2 value of 10 to $1E+4$	15
Clayey sands; silts; shales; unfractured, non-sedimentary rocks k, Darcys value of $1E-3$ to 1, or K, gpd/ft 2 value of $1E-2$ to 10 (Modified from Davis and DeWiest, 1966)	3
B3 SCORE:	0

B4. Recharge: Annual

Precipitation (inches)	POINTS	Precipitation (inches)	POINTS
>25	30	10 - 14	15
20 - 25	25	5 - 9	10
15 - 19	20	<5	5
B4 SCORE:	0		

SUMMARY SCORE FOR SECTION 2B:
(sites without a drastic score)

Depth to Groundwater score	(B1 SCORE)	0
Vadose zone impact score	(B2 SCORE)	0
Aquifer hydraulic conductivity	(B3 SCORE)	0
Recharge score	(B4 SCORE)	0

2B SUBTOTAL 0

ADD 50 POINTS FOR PSEUDO DRASTIC SCORE 50

PSEUDO DRASTIC SCORE 0

Determine which range this pseudo drastic score value falls in by referring to part A and enter the Drastic score below.

SUBTOTAL SECTION 2 SCORE

(Points from Part A using either Drastic or pseudo Drastic score) SCORE 0

ADD 5 points if cultural activities which would increase recharge exist within 100 feet of the release. SCORE 0

SECTION 2 TOTAL SCORE: 0

REVISED
PUBLIC PARTICIPATION SUBCOMMITTEE RECOMMENDATIONS
TO THE GROUNDWATER CLEANUP TASK FORCE

November 7, 1996

INTRODUCTION

The Arizona Groundwater Task Force's (AZGWTF) Public Participation Subcommittee (the subcommittee) has met regularly over the past few months to assess the role of public notification, public participation and community information at Arizona's WQARF sites and/or study areas. The purpose of this assessment was to identify needs and opportunities for making recommendations to the AZGWTF that will improve on the current WQARF program regarding community involvement requirements. The intent of the following recommendations is that they apply to groundwater only, excepting when contaminated soils are known to be a threat or are contributing to groundwater contamination. The subcommittee's overall objective has been to develop recommendations that will facilitate and expedite cost effective groundwater cleanup.

In the judgement of the subcommittee, public notification, public participation and community information are critical elements of successful WQARF site remediation. The subcommittee has further concluded that the existing WQARF statute does not adequately provide methods for public notification, public participation or community information as related to the overall WQARF process.

The subcommittee believes that minimum standards and procedures should be established to ensure successful implementation of public participation and community information programs. The funding and agency staff necessary to provide for those programs are not generally available at adequate levels. Dedicated funding sources and agency staff will be required to ensure successful public notification, public participation and community information programs. The subcommittee believes significant public participation is integral to achieving the goals of facilitating and expediting cost-effective groundwater cleanup.

RECOMMENDATIONS

Therefore, the subcommittee hereby recommends that the WQARF statute be revised to effectively address public notification, public participation, and community information processes and to adequately provide dedicated funding for these processes as outlined below. The subcommittee further recommends the director of ADEQ expedite the process by immediately initiating the promulgation of rules to implement the following within 180 days. ADEQ shall have the discretion for sites participating in ADEQ's voluntary program to exempt those sites from some but not all requirements for public notice and participation.

- 1.0 ADEQ shall provide for public notification, public participation and community information processes at all existing or proposed WQARF sites and/or study areas designated under the WQARF program except where provided for in section 5.0, 5.1 and 5.4, except as provided for hereinafter.

- 2.0 Dedicated and adequate funding and staff shall be reserved for exclusive use in the ADEQ WQARF public notification, public participation and community information programs. When there are responsible parties, they shall bear the costs of these programs.
- 2.1 Where there are responsible parties, they shall bear their allocated share of the costs of these programs.
- 3.0 COMMUNITY shall be defined to include the broad spectrum of parties determined to be within the WQARF study area and/or site, and/or community involvement area of an existing or proposed WQARF site and/or study area and shall be determined by the director of ADEQ to include but not to be limited to any of the following.
- (1) The geographic area that is or could become contaminated by a release of hazardous substances as prescribed by §49-221 (1) whereby an exceedance of a drinking water aquifer water quality standard has occurred or (2) where no drinking water quality standard has been established, then Department of Health Services shall (a) conduct a contaminant-specific risk analysis, (b) determine whether the level is such that there is a threat to human health and the environment, and (c) advise the director of ADEQ of the results. ADEQ will inform ADWR of the identified community and provide ADWR an opportunity to comment thereon.
 - (2) Well sites within WQARF sites and/or study areas that are within these areas.
 - (3) A water provider who has or is required to provide water to authorized users who are located within these areas.
 - (4) Any city, town, or municipal government that:
 - (a) currently uses, or plans to use groundwater resources from within these areas; or
 - (b) could be significantly impacted by the loss of a natural resource area due to surface or groundwater contamination resulting from the release of hazardous substances.
- 3.1 For purposes of the Public Notification, Public Information and Participation portion of the WQARF program, the definition of a COMMUNITY INVOLVEMENT AREA (CIA) shall mean the geographical area that is within the WQARF site and/or WQARF study area and additional geographic areas as found appropriate in the director's discretion. Input may be obtained from the Community Advisory Board. It will be an annual assessment.

3.2 The director of ADEQ shall conduct WQARF site and/or study area reviews on an annual basis at a minimum, and WQARF site and/or study area boundaries may expand or retreat as warranted by results of the remedial investigation and annual performance reviews. The director shall notice the affected community of the changes as required in section 5.1 and thereafter. WQARF site and/or study area designations may expand or retreat based upon measurements and analyses of the data provided in the WQARF site and/or study areas routine reports as provided by ADEQ or the responsible party, and changes will be reflected in the annual publication of the Remedial Projects Information Packet.

3.3 **WQARF Site and/or WQARF Study Area BOUNDARY ADJUSTMENT PETITIONS**

Some WQARF sites and/or study areas include geographic areas that are, based on the results of remedial investigations, not located above groundwater contamination. In such areas, any affected property owner(s) may petition the director of ADEQ to exclude those area(s) from the WQARF site and/or study area. ADEQ will provide a standardized petition form. The geographic area covered by the boundary adjustment petition shall be described by legal description.

The director shall then consider such petitions within ninety days of receipt of the petition and shall determine, based on the results of the remedial investigation, whether the geographic area is in fact not located above groundwater contamination. The director shall also verify signatures on the boundary adjustment petition as being true and correct and the accuracy of the legal description.

If the director determines, based on the results of the remedial investigation, that the boundary adjustment petition area is above, either entirely or in part the groundwater contamination, the director shall deny and reject the boundary adjustment petition and shall not exclude the area from the WQARF site and/or study area.

If the director determines, based on the results of the remedial investigation, that the boundary adjustment petition area is presently not located above groundwater contamination, but is predicted to be above it either entirely or in part within two years from the date of the petition, the director shall deny the boundary adjustment petition and shall not exclude the area from the WQARF site and/or study area.

If the director, based on the results of the remedial investigation, determines that the boundary adjustment petition area is not located above groundwater contamination and is not predicted to be above groundwater contamination within two years from the date of the boundary adjustment petition, the director shall approve the petition and remove the geographic area covered by the petition from the WQARF site and/or study area. When such boundary adjustments are approved, the director shall ensure that the site map is adjusted appropriately and shows the plume area drawn in. The director shall also ensure that all property owners within the adjusted area are notified by mail of the new

boundary changes.

4.0 PUBLIC INFORMATION. Where the document uses the words, "public information," it does not imply the entire public record. Rather the information to be collated and distributed pursuant to this document has been defined within this document.

4.1 A SITE DESCRIPTION PACKAGE will be available prior to the start of the 30-Day Comment Period for the Proposed Annual Priority List as a reference guide for the proposed and/or continuing sites, and shall include:

- (1) A brief description of the Annual Priority List Process;
- (2) A listing of the newly proposed site(s) and/or continuing sites;
- (3) The total amount of funding available for the fiscal year and the amount of money needed for each site;
- (4) The estimated cleanup date (if determined);
- (5) The project manager's name, address, and phone number;
- (6) A statewide map that includes the location of all sites proposed for the Annual Priority List.

4.2 The Site Description Package shall be sent to the political subdivisions, municipalities, state agencies, remedial action coordinators, neighborhood associations, and are on hand if requested by members of the public.

4.3 For each site, the description shall include:

- (1) A brief historical background of the site, including the geographical location;
- (2) A brief description of the issues or problems associated with the site, including a listing of the contaminants, and if available, a brief summary of the ecological and human health risk assessments; and
- (3) The name, address, and phone number of the agency contact person who may provide additional information .

4.4 FACT SHEETS shall be provided for all existing WQARF priority list sites and other WQARF sites and/or WQARF study areas, and shall include a summation of the following:

- (1) A brief background of the site ;
- (2) A description of the issues or problems associated with the site, including a listing of contaminants and, if available, a brief summary of the ecological and human health risk assessments;

- (3) A brief summary of current or proposed activities of the investigative/cleanup program;
- (4) A description of the remedial alternatives considered (if available);
- (5) A description of public participation opportunities during the cleanup process;
- (6) The location of public information repositories where material is available to the public for review;
- (7) The address and location of the site, including a site map;
- (8) A reference to the Arizona Department of Real Estate's requirements for disclosure of Superfund sites (when applicable);
- (9) The name, address, and phone number of the agency contact person who will provide additional information; and,
- (10) A description of the area impacted by the contamination together with a map of the area, if it has been defined).
- (11) (a) Whether drinking or irrigation wells are working in the affected area; (b) whether drinking or irrigation wells have been taken off-line, and if so, which wells and on which dates; (c) whether the soil or water is contaminated such that inhalation or dermal exposure to contaminants at a significant risk level is likely; and, (d) the depth of contaminated soil, surface water, or groundwater based on the most precise data possessed by ADEQ.

4.5 FACT SHEETS are sent to the community as defined above.

5.0 PUBLIC PARTICIPATION shall include avenues of access for community involvement on existing or proposed WQARF sites and/or study areas.

5.1 PUBLIC NOTIFICATION

In addition to existing public notification requirements established in the WQARF public participation program, the following procedures are recommended with the intent of increasing public awareness about the potential or existing threat imposed by groundwater contamination originating from existing or proposed WQARF sites and/or study areas.

ALL of the measures recommended are contingent on dedicated and adequate funding reserved exclusively for WQARF public participation activities.

For remedial actions to be implemented and completed within a period of 180 days or

less, items 5.1.2, 5.1.3, 5.1.4 (a) through (d), 5.2, 5.3, 5.4, 5.5, 5.6 and 6.0 do not apply.

PUBLIC NOTIFICATION PROCEDURES:

(1) Initial disclosure to Property Owners Within Property Located within CIA

Initial disclosure shall be made by ADEQ to all owners of property located within the community, using property records maintained by the County Assessor's Office. Initial disclosure should occur prior to the notification of a community within an existing or proposed WQARF site and/or study area. The initial disclosure shall state at a minimum:

- (a) whether drinking or irrigation wells are working in the affected area;
- (b) whether drinking or irrigation wells have been taken off-line, and if so, which wells and on which dates;
- (c) whether the soil is contaminated such that inhalation or dermal exposure to contaminants at a significant risk level is likely; and,
- (d) the depth of contaminated soil, surface water, or groundwater based on the most precise data possessed by ADEQ.

(2) Noticing to Communities

For all proposed and existing WQARF sites and/or study areas, a mailing shall be sent to all members of the community (including, but not limited to residences, businesses, community action groups, and public libraries). The mailing shall be comprised of a fact sheet based on Recommendation 4.4 and shall be delivered to the community as determined by ADEQ.

(3) Local Public Information Repositories

Local repositories for follow-up information shall be provided at public libraries or other public facilities within the WQARF site and/or study areas. A site description package would be included at each local repository as well as at ADEQ. Commentary and status reports could also be provided at the local repositories. Coordination with the library staff and ADEQ program managers is necessary in order to properly implement this alternative.

Prior to remedial investigation, the agency must establish an public information repository at or near the site. At a minimum, local repositories shall contain remedial

investigations, the community involvement plan, ecological and human health risk assessments if available. Items developed, received, published, or made available to the public may be made accessible for public inspection at or near the facility.

(4) Additional Notice Requirements

For study areas representing broader based non-site specific geographical boundaries where in some instances only certain portions of the overall study area may be impacted by groundwater contamination, a mass mailing of the initial disclosure notice may become a waste of limited departmental money and resources. Therefore, at the director's discretion to address the need for broader public exposure however, several alternatives are listed below. One or more of these alternatives shall be implemented.

- (a) Establish an extension of the mailing process described for noticing WQARF sites and/or study areas, whereby all public offices and community action groups outside of the immediate WQARF remedial site and study area would also be mailed a fact sheet.
- (b) Use local television or radio to provide a brief summary of the WQARF process and a description of the specific site in question. Processes for obtaining public information and the location of local repositories of information would also be provided in this forum.
- (c) Establish an Internet site to inform and update the public about the WQARF process and the status of activities at each site and study area.
- (d) Establish an educational workshop to educate the public about the WQARF process.

5.2 SITE SURVEYS & INTERVIEWS

RP(s) shall identify issues, concerns, and opportunities related to expeditious cleanup of the site and to facilitate public participation and information processes at all WQARF sites and/or study areas within 90 days after the site is listed. Issue identification shall be accomplished by door to door surveys, interviews or other appropriate means to be selected at the discretion of the director.

Any surveys shall constitute a valid demographic cross-section of the community's population and survey/interview questions shall be designed to impart information related to the site, to acquire information on how the site may affect residents, property uses, property values, and to identify the community's concerns related to the site's management.

In the event that the site has no RP(s), ADEQ shall identify the issues, concerns, and opportunities.

5.3 COMMUNITY ADVISORY BOARDS

Community Advisory Boards (CAB) shall be established for all WQARF sites and/or study areas. The CAB shall elect co-chairs and establish a charter defining the CAB's goals and operating procedures.

Community Advisory Boards shall be established by a Selection Committee consisting of one ADEQ representative, an RP (if any) representative, a local elected official and two community members. The selection committee will advertise for participants, take nominations, act as a clearinghouse and screening board to select a diversified community advisory board whose targeted size is between 5 and 20 people. The selection committee will agree by majority vote on the list of applicants to be appointed to the Community Advisory Board.

The selection committee will make the list of applicants for the community advisory board as well as the names of the selected participants available to the public. The RP will accept the advisory board members as submitted unless the RP determines that it is not sufficiently diversified with an appropriate balance of parties or an affected group within the community has been omitted.

The CAB shall meet with ADEQ and the RP(s), if any, quarterly at a minimum to receive site briefings, tours, progress reports and other pertinent information. The CAB shall advise ADEQ, the public, and the RP(s), if any, on issues, concerns, and opportunities related to expeditious cleanup of the site and on facilitating public participation and information processes.

The CAB established for each WQARF site and/or study area may advise ADEQ to enlarge the CIA, taking into account the threat to public health within an expanded time period.

The CAB shall coordinate with ADEQ to establish local repositories for the dissemination of information to the public about the WQARF site and/or study area.

The CAB may recommend additional means to notify the CIA in the interest of providing information to a broader public area which may possess an interest in the remedial process.

Multiple WQARF sites and/or study areas may share a CAB to avoid unnecessary, multiple CABs.

5.4 COMMUNITY INVOLVEMENT PLAN

All WQARF sites and/or study areas shall have Community Involvement Plans including all of the recommendations contained herein and any other requirements that may be needed for CERCLA compliance. Multiple WQARF sites and/or study areas may share a CIP to avoid unnecessary, multiple CIPs. Existing WQARF site and/or study area communities with approved involvement plans will be grandfathered for this requirement. Based upon the community interviews, the Community Involvement Plan will include a description of the site background, history of community involvement at the site, community relations programs, a schedule of community involvement and participation activities, and a list of community contacts, local officials and interested parties. The agency must complete this plan prior to completion of remedial investigation field activities.

5.5 SPOKESPERSON

The agency must designate a spokesperson, the RP if appropriate, to inform the public about the clean up site remedial actions taken and to act as liaison between ADEQ and the RP.

5.6 NEWSLETTERS

ADEQ or the RP(s), if any, shall regularly publish and distribute a newsletter to all residents within the WQARF site and/or study area. The newsletter shall provide current information concerning the site's status, upcoming meetings, CAB activities, survey results and other pertinent information.

6.0 PUBLIC NOTIFICATION for the annual priority list shall provide a summation of the following:

- (1) a brief description of the proposed annual priority list;
- (2) a geographic description of the proposed sites and/or continuing sites and any delisted sites;
- (3) reference to the Site Description Package;
- (4) the location(s) where information concerning the proposed annual priority list is available;
- (5) the location(s) where official records for the proposed sites are maintained;
- (6) the name, address and telephone number of the person to whom comments or inquiries may be addressed;
- (7) the time and date when the comment period closes;
- (8) notice of upcoming meetings.

7.0 PUBLIC NOTIFICATION for a proposed groundwater Remedial Action Plan (RAP) shall provide a summation of the following:

- (1) a brief description of the proposed RAP;
- (2) a geographic description of the location of the remedial action;
- (3) a description of the area impacted by the contamination;
- (4) reference to the site "Fact Sheet" or site information;
- (5) the location(s) where information concerning the proposed RAP is available;
- (6) the location(s) where official records for the site are maintained;
- (7) the name, address and telephone number of the person to whom comments or inquiries may be addressed;
- (8) the time and date when the comment period closes; and
- (9) notice of upcoming meetings.

8.0 ANNUAL COUNTY MEETINGS

So that the entire Arizona community remains informed on an annual basis regarding the progress on WQARF site and/or study area cleanups, ADEQ shall hold a public meeting in each county once a year to provide information regarding WQARF sites and study areas, funding, cleanup, priorities, remediations, status reports and any other information that may be regarded as useful to apprise the taxpayers on the use of the WQARF funds.

End Use Subcommittee

Final Report

Introduction

The End Use Subcommittee membership is shown in Appendix 1 to this report. At the first subcommittee meeting, the members selected Greg Witherspoon of Salt River Project, and Phil Lagas of Basin & Range Geohydrologists as co-chairs. The members also affirmed the Groundrules and protocols adopted by the full Groundwater Cleanup Task Force as applicable all subcommittee members.

The work product of the subcommittee was defined as:

Evaluate and determine the better or best uses of remediated groundwater. Provide recommendations to facilitate that use through policy, rule and statutory changes and improved interagency coordination which remove or mitigate impediments and provide incentives.

Through substantive and detailed discussions, the subcommittee addressed the following major issues in providing the agreed upon work product and developing recommendations.

Impediments	Incentives	Recharge Issues
Reinjection	Liability Limits	Accounting Issues
Safe Yield	Conservation	Assured Water Supply
Site Investigation	Risk Assessment	Well Production
APP Requirements	Application of Standards	
Interagency Coordination		

Recommendations

The following recommendations from the End Use Subcommittee were approved by the Groundwater Cleanup Task Force.

The lack of formal, ADEQ sanctioned end use standards specifically applicable to the use of remediated groundwater appears to have contributed to delays in cleanups and reluctance on the part of potential end users and transporters of remediated groundwater to accept delivery of this water.

ADEQ should develop by rule end use standards, which may include numeric levels and operational controls, which shall be appropriate to specific end uses of remediated groundwater, for inclusion in Title 18 of the Arizona Administrative Code. Any end use standards developed will address those contaminants most commonly encountered in groundwater remediation projects, and may distinguish between remediated groundwater transported in a constructed water conveyance system, and remediated groundwater applied directly to that specific end use. Any rules developed for end use standards should also permit the development of site specific end use standards and controls utilizing a risk assessment methodology acceptable to the Director of ADEQ. End use standards developed for remediated groundwater shall only be applied pursuant to an approved Remedial Action Plan. (Aug. 8, 1996)

In support of the recommendation to develop specific end use standards, the Groundwater Task Force on September 19, 1996 endorsed a revised document entitled Presumptive End Use "Standards" Proposal: A Conceptual Process (Originating from an ADEQ Strawman Proposal) September 11, 1996. That document is attached as Appendix 2.

The costs of use or discharge of remediated groundwater should be considered a part of the total remediation project costs. (Aug. 22, 1996)

The directors (ADEQ & ADWR) should be granted authority, subject to criteria ensuring the protection of public health and the environment, to waive regulatory requirements which conflict with specific remedial action plans the department(s) would otherwise approve. (Aug. 22, 1996)

Establish a process for ADWR and ADEQ to work together with the responsible parties to identify and facilitate end uses **early** in the process of developing remediation options, and approve the selected use or discharge option. (Aug. 22, 1996)

To provide incentives for beneficial use of remediated groundwater and minimize current barriers to its use, establish liability limits for providers of water who accept remediated water and for users of remediated water. (Aug. 22, 1996)

In order to accomplish the liability limits recommended above, the Task Force, on September 19, 1996 approved two alternative recommendations.

Proposal 1

With respect to actions for personal injury or property damage arising out of the transportation, distribution or use of remediated water, remediated water shall be deemed reasonably safe and fit for consumption and use, and the provider or user shall be deemed to have acted reasonably, if:

1. the remediated water complies with applicable state or federal standards, or
2. the remediation has been conducted pursuant to an approved remedial action plan under WQARF, or
3. the remediation has been conducted pursuant to an approved Consent Decree under CERCLA.

For purposes of this section only:

1. a "provider" is an owner or operator of a constructed water conveyance system, which conveys water for industrial, municipal or irrigation purposes;
2. a "user" is an entity which accepts remediated water and utilizes such water for industrial, municipal or irrigation purposes.

Proposal 2

A provider or user of remediated water is not liable for damages caused or contributed to by the use or distribution of the remediated water except upon a showing of willful, malicious or grossly negligent conduct which was the direct cause of the damages.

For purposes of this section only:

1. "provider" means owners or operators of constructed water conveyance systems for industrial, municipal or irrigation purposes;
2. "damages" means death or injury to a person, or claims for medical monitoring, or injury that a person may suffer, or property damage that would be actionable absent the liability limitation granted herein;
3. "remediated water" means water that is used or discharged in connection with a CERCLA or WQARF remediation, or that meets applicable state or federal standards.

Three members of the End Use Subcommittee submitted comments addressing the two alternatives. Those comments are attached as Appendix 3.

The Groundwater Task Force, on Nov. 7, 1996 approved the following principles addressing accounting, conservation, and safe yield issues and the Assured Water Supply regulations.

Principle 1. Conservation Accounting.

Remediated groundwater withdrawn pursuant to WQARF, CERCLA, or other applicable federal or state law shall be accounted for by ADWR in the same way that surface water is accounted for in conservation accounting.

Principle 2. Small Volume Exemption.

Remediated groundwater in volumes of 250 acre feet or less per year per project withdrawn pursuant to WQARF, CERCLA, or other applicable federal or state law shall be exempt from all replenishment obligations, but shall be subject to the requirement that groundwater withdrawn be used beneficially, whenever practicable.

Principle 3. Assured Water Supply; Annual Volumetric Cap.

Remediated groundwater withdrawn pursuant to WQARF, CERCLA, or other applicable federal or state law shall not be debited from an end user's Assured Water Supply mined groundwater account. ADWR, ADEQ, and the regulated community shall attempt to reach consensus before Dec. 1, 1996 upon an annual volumetric cap of groundwater not to be debited. Should the total annual volume of remediated water used by parties who have Assured water Supply mined groundwater accounts exceed the volumetric cap, all such uses in excess of the cap shall be subject to a phased in replenishment obligation.

Appendix 1

**End Use Subcommittee
of the Ground Water Task Force**

Participant Name:	Company Representative:	Phone:	FAX:
Aerni, Wayne	ADEQ	207-4217	207-2218
Alberhasky, JoEllen	City of Glendale	930-2703	915-3094
Arnold, Kathy	ASARCO/AMA	520-798-7738	520-350-8645
Yantorno, Duane		520-798-7745	
Ashby, Stan	RID	386-2046	386-4360
Bartlett, Doug	Valley Partnership	861-7409	861-7431
Bennett, Pamela	Valley Partnership	258-5866	258-8428
Blue, Karen	Motorola	244-5364	244-6658
Boyer, John	APS	250-3196	250-3872
Briggs, Phil	Garaghty & Miller	438-0883	438-0102
Chase, Bill	City of Phoenix	261-8855	495-5650
Clement, Gail	Clement & Associates	314-9499	314-9477
Benson, Charlotte	Arizona Attorney Generals Ofc.	542-8541	542-4084
Clifford, Joe		542-1401	
Klein, Mitch		-	
Pollock, Linda		542-8534	
Skardon, Jay		542-1610	
Danos, V. C.	AMWUA	248-8482	248-8423
Davis, Scott	APS	250-3225	250-3872
Dean, Thom	Zanitech Corporation	414-1800	414-1810
Derouin, Jim co-chair	-	-	257-5299
DuBois, Jim	ADEQ	(520) 628-6741	(520) 473-7191
Egnatios, Rockne	Superide Design	921-8618	-
Gaylord, Karen	City of Tempe	350-8227	350-8645
Bolitho, Mason	ADWR	417-2400 x-7124	417-2401
Gibson, Tim		417-2400 x-7225	
Gill, Harold E.	Miller Brooks Environmental, Inc.	943-5450	943-5349
Goldberg, Barbara	City of Scottsdale	994-2405	994-2548
Haglin, Cynthia	City of Chandler		
Hamilton, Steve	EMCON	470-0444	470-0567
Kimball, David	Gallagher & Kennedy	530-8221	530-8101
Lagas, Phil	Basin & Range Hydrogeologists	840-3333	840-8011
Mahar, Maria	City of Scottsdale	391-5747	391-5615
Marsh, Floyd	AHS/Scottsdale	391-5683	

End Use Subcommittee of the Ground Water Task Force			
Participant Name:	Company Representative:	Phone:	FAX:
McCain, Bob	AMWUA	248-8482	248-8423
McCullar, Mike	Growth Resources, Inc	470-1773	470-1545
Meade, Sharon	Hansen, Meade & Campbell	952-3905	952-4175
Miller, Beth	City of Mesa	644-2947	644-2768
Mooney, Tom	CH2MHILL	966-8188	966-9450
Nesky, Michael	ADEQ	207-4215	-
Niven, Tom	Basin & Range	840-3333	840-8011
O'Regan, Karen	City of Phoenix	256-5669	-
Olson, Steven	ADWR	417-2408	417-2415
Peters, Karen co-chair			253-8129
Plato, Paul	Harding Lawson Associates	224-0844	224-5133
Price, Sandy	Sacks Tierney for City of Tucson	240-2629	279-2027
Ressler, Bob	Cyprus Miami/AMA	(520) 473-7016	(520) 473-7191
Gorey, Tim	SRP	236-2702	236-2987
Kornrumph, Greg		236-3264	236-2159
Roberts, Dave		236-2343	236-2159
Siegel, Richard		236-2277	236-2159
Schmidt, Shiela	Jennings, Strouss, Salmon	262-5879	253-3255
Shein, Dan	House of Representatives, staff	542-3146	542-4511
Shirley, Dennis	Motorola	441-4123	441-2130
Staudermaier, Bill	APS	250-3626	
Steele, Tim	ADEQ	207-4224	207-4236
Welker, J. Brent	Burch & Cracchiolo, P.A.	234-9942	234-0341
Whitmore, Phil	ADEQ	207-4423	207-4236
Whitten, Rodney	US Air Force	(415) 705-1695	(415) 705-1682
Witherspoon, Greg	SRP	236-2717	236-3407

Appendix 2

PRESUMPTIVE END USE "STANDARDS" PROPOSAL
A Conceptual Process
Originating From An ADEQ Strawman Proposal

September 11, 1996

Position Statement Approved by the Groundwater Cleanup Task Force
August 11, 1996:

The lack of formal, ADEQ sanctioned end use standards specifically applicable to the use of remediated groundwater appears to have contributed to delays in cleanups and reluctance on the part of potential end users and transporters of remediated groundwater to accept delivery of this water.

ADEQ should develop by rule end use standards, which may include numeric levels and operational controls, which shall be appropriate to specific end uses of remediated groundwater, for inclusion in Title 18 of the Arizona Administrative Code. Any end use standards developed will address those contaminants most commonly encountered in groundwater remediation projects, and may distinguish between remediated groundwater transported in a constructed water conveyance system, and remediated groundwater applied directly to that specific end use. Any rules developed for end use standards should also permit the development of site specific end use standards and controls utilizing a risk assessment methodology acceptable to the Director of ADEQ. End use standards developed for remediated groundwater shall only be applied pursuant to an approved Remedial Action Plan.

OBJECTIVE

The objective of this End Use proposal is to identify some end use scenarios that are designed to achieve consumptive or nearly consumptive use of remediated groundwater. The purpose of this constraint is to limit the groundwater discharge exposure pathway as much as possible. Additional constraints have been adopted from ADEQ's Wastewater Reuse Program where they help to limit public access, worker exposure, or prevent operational mishaps such as cross-connections.

For each use category, assumptions are presented regarding site conditions and design/operational controls. Additionally,

potential exposure pathways are identified, so appropriate concentration levels for safe application of the treated water may be developed. Through the rule making process, ADEQ would use these assumptions to have the Arizona Department of Health Services (ADHS) perform a health-based risk assessment to determine acceptable concentration levels for each use category. Concentration levels, site condition limitations, and design/operational controls would be adopted in WQARF rules as part of the remedial action plan (RAP) approval process.

It is important that concentration levels not be identified as "standards" to be applied independent of the site conditions and controls from which they were developed. The end use concentration levels, in conjunction with site conditions and controls, represent a risk-based presumptive end use for remediated groundwater. Any end use option meeting the constraints used to develop the end use scenarios would be presumed to be acceptable for approval in a RAP if the concentration levels, and applicable constraints, are maintained. Thus, site specific risk assessments would not be necessary in such instances.

This approach is meant to provide a presumptive option for end use approval in a RAP. It is not meant to preclude an optional risk assessment that might arrive at alternative site-specific concentration levels.

AUTHORITY

In setting End Use standards, the Director may draw on authority of A.R.S. 49-221.B., which states,

The director may adopt, by rule, water quality standards for waters of the state other than those described in subsection A of this section, including standards for the use of water pumped from an aquifer that does not meet the standards adopted pursuant to section 49-223, subsections A and B and that is put to a beneficial use other than drinking water. These standards may include standards for the use of water pumped as part of a remedial action.

This section of statute does not constrain where the Director should enshrine the end use standards in rule. Therefore, it is proposed that these "Standards" be included in the WQARF rules at Title 18, Chapter 7, and integrated into the RAP approval process.

POTENTIAL PRESUMPTIVE END USES:

The end use committee selected the following end uses because they represent some of the categories of highest water use that are amenable to non-potable standards. Industrial process water use is not represented here because the development of standards would depend on the process, varying from industry to industry. This list is not meant to be all-inclusive, and other uses could be proposed during rule development. Additionally, a potential end use may be removed from this list, if during rule development or risk assessment the use is determined to be inappropriate.

- 1) Agricultural Irrigation
 - a) food crops
 - b) non-food crops
- 2) Landscape Irrigation (e.g. golf courses, parks)
- 3) Ornamental Lakes (excluding wetlands)
- 4) Dust Control or Construction Water for Compaction
- 5) Sand & Gravel Washing
- 6) Constructed Open Water Conveyance Systems (except canals that have a designated use of DWS pursuant to R-18-11-104 et seq.)
- 7) Livestock Watering (to be added).

POTENTIAL SUBSTANCES

The substances list is limited in order to make it easier for ADEQ and ADHS to determine health based concentration levels. We have tried to represent, here, the most common pollutants targeted in remedial actions. Most of these substances have

established Aquifer Water Quality Standards. With the possible exception of MTBE, the substances also have been more widely studied for health risk effects than many other compounds. For these reasons, the evaluation to establish concentration levels for end uses will be manageable in the rule development process. However, this list is not meant to be all-inclusive, and other substances could be proposed during rule development. Additionally, a potential substance may be removed from this list, if during the rule development or risk assessment sufficient health risk information is not available for the substance.

TCE
PCE
BTEX
DCE
TCA
DBCP
EDB
Vinyl Chloride
MTBE
Chromium (other metals?)

POTENTIAL EXPOSURE PATHWAYS

Each of the presumptive end uses described below contains a list of potential exposure pathways. This listing is for discussion purposes to represent those pathways that ADEQ and ADHS are likely to consider to arrive at acceptable health-based concentration levels. The list of potential pathways associated with each end use is not meant to preclude other pathways from evaluation, if in the course of risk assessment other significant pathways are identified. Additionally, this list of potential pathways may be reduced, if those listed are identified as insignificant during the course of risk assessment. As in any risk assessment, the pathway with the highest level of identified risk will become the most limiting for setting concentration levels. We cannot, without actually conducting the modeling, predict which of the pathways will be the most limiting. However, it is important to note that some of the pathways identified in the discussion will not be significant because of the assumptions of site conditions/operational controls placed on

the end use. We have focused primarily on limiting the groundwater exposure pathway in development of the assumptions to ensure that it does not become the most restrictive.

STANDARD SETTING PROCESS:

General Assumptions/Controls:

- 1) Direct application to the End Use (i.e. no open conveyances before end use compliance point);
- 2) End Use compliance point is located prior to the end of closed conveyance (i.e. end of pipe);
- 3) End Use standards comply with applicable federal standards;
- 4) Depth to groundwater shall be determined from historical/seasonal high water levels; and
- 5) ADEQ shall have reasonable and necessary authority to ensure that controls are in place, and to require corrective action to meet those controls.

Assumptions/Controls Specific To the End Use:

Agricultural Irrigation (food crops):

Potential Exposure Pathways: Food Consumption; Bioaccumulation; Dermal; Inhalation Industrial; Inhalation Residential; Ingestion Industrial; Groundwater; Surface Water.

Risk Level: Human Food Consumption pathway would apply using the most critical crops (root crops like carrots & potatoes are most prone to sorption from the soil). Food chain concentration effects may be critical in forage crops and pasture. Industrial risk factors would be used on-site and residential risk factors would apply for adjacent residential areas. Groundwater risk depends on the leaching fraction which in turn depends on agricultural efficiency.

Assumptions:

- 1) Depth to groundwater greater than "x" feet.
- 2) The irrigated area shall contain the 10 yr/ 24-hour storm event.
- 3) The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 4) No coarse sand or gravel soils. Field has a developed plough zone of 3 feet with high organic matter.
- 5) Application is by flood or furrow irrigation.

Agricultural Irrigation (non-food crops):

Potential Exposure Pathways: Dermal; Inhalation
Industrial; Inhalation Residential; Ingestion
Industrial; Groundwater; Surface Water; Incidental
Drinking Water.

Risk Level: Industrial risk factors would be used onsite and residential risk factors would apply for adjacent residential areas. Incidental drinking exposure could be covered by using Partial Body Contact Standard from SWQS. Groundwater risk depends on the leaching fraction which in turn depends on agricultural efficiency.

Assumptions:

- 1) Depth to groundwater greater than "x" feet.
- 2) The irrigated area shall contain the 10 yr/ 24-hour storm event.
- 3) The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 4) No coarse sand or gravel soils. Field has a developed plough zone of 3 feet with high organic matter.
- 5) Application is by flood or furrow irrigation.

Landscape Irrigation (e.g. golf courses, parks):

Potential Exposure Pathways: Dermal; Inhalation
Industrial; Inhalation Residential; Ingestion
Industrial; Ingestion Residential; Groundwater; Surface
Water; Incidental Drinking Water

Risk Level: residential landscape irrigation
Incidental Drinking Exposure could be covered by using
Partial Body Contact Standard from SWQS.

Assumptions:

- 1) Depth to groundwater greater than "x" feet.
- 2) The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 3) Application is by spray irrigation limited to such times of the day as to reasonably preclude direct human contact.
- 4) Ponding conditions are avoided.
- 5) Public access is not restricted by signage, supervision, and/or physical barriers.
- 6) Irrigation spray does not reach any privately-owned premises, drinking fountains, or unplanted areas.
- 7) Hose bibbs discharging irrigation water are posted with signs reading "Non-potable water supply, do not drink", or similar warnings, or secured to prevent access.
- 8) Irrigation pipe will be color coded, buried with colored tape, or otherwise suitably marked to indicate non-potable water.
- 9) The irrigation system will be designed, constructed, and tested prior to operation, to prohibit cross-connection with potable systems.
- 10) Onsite storage is in impoundments lined with a liner with 1×10^{-7} cm/sec permeability. Hydraulic head on the liner shall not exceed "x" feet.

- 11) The landscape/turf irrigated area will contain the 10 yr/ 24 hour storm event.

Ornamental Lakes

Potential Exposure Pathways: Dermal; Inhalation
Residential; Ingestion Residential; Wildlife; Fish
consumption; Groundwater; Surface Water

Risk Level: Residential risk factors.

Assumptions:

- 1) Limited size/volume and head on liner (Open for discussion)
- 2) Minimum depth to groundwater "x" feet
- 3) The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 4) Lined with 10-7 cm/sec permeability liner. Minimum aerosol effects.
- 5) Free-board capacity of "x" volume (i.e. flood protection)
- 6) Public access is restricted by signage, supervision, and/or physical barriers. Posted signs (e.g. "No swimming, fishing, drinking...").
- 7) No secondary or alternate use will be allowed.
- 8) Will contain 10 year 24 hour flood on site.

Dust Control (Residential)

Potential Exposure Pathways: Dermal; Inhalation
Residential; Ingestion Residential; Groundwater;
Surface Water

Risk Level: Residential risk factors would be used.

Assumptions:

- 1) Site is outside the 100 yr. floodplain.
- 2) There will be no surface runoff (NPDES discharge).
- 3) Water is applied to soil materials excluding coarse sand, gravel, or fractured bedrock.
- 4) Depth to groundwater is greater than the evaporative depth for the site.
- 5) No rainfall has occurred within the past 24 hours.
- 6) Application rate is sufficient to control dust but not so as to generate saturated conditions.
- 7) Ponding conditions will be avoided.

Dust Control (Non-Residential)

Potential Exposure Pathways: Dermal; Inhalation
Industrial; Ingestion Industrial; Groundwater;
Surface Water

Risk Level: Industrial risk factors would be used at industrial construction sites, mines, landfills, and agricultural applications.

Assumptions:

- 1) Site is outside the 100 yr. floodplain.
- 2) There will be no surface runoff (NPDES discharge).
- 3) Water is applied to soil materials excluding coarse sand, gravel, or fractured bedrock.
- 4) Depth to groundwater is greater than the evaporative depth for the site.
- 5) No rainfall has occurred within the past 24 hours.
- 6) Application rate is sufficient to control dust but not so as to generate saturated conditions. Water is dispersed by truck so as to minimize aerosol effects.
- 7) Ponding conditions shall be avoided.

- 8) Public access is restricted by signage, supervision, and/or physical barriers.
- 9) Employees are informed of the site safety plan & record of employees is kept.
- 10) Trucks, storage tanks, and other exposed equipment to be used at other sites or for other activities are to be properly decontaminated.
- 11) The water is not to be used for other processes, such as materials or equipment washing.

Sand and Gravel Washing

Potential Exposure Pathways: Dermal; Inhalation
Industrial; Ingestion Industrial; Inhalation
Residential; Ingestion Residential; Groundwater;
Surface Water

Risk Level: May be different for industrial vs residential if operation is close to residential area. Industrial risk factors would be used within the facility boundary if access controls are adequate.

Assumptions:

- 1) Site outside of active channel .
- 2) There will be no surface runoff (NPDES discharge).
- 3) Depth to groundwater is greater than "x " for the site.
- 4) Limitations on physical characteristics of soil. The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 5) Impounded water is limited and its migration/transport is controlled.
- 6) Ponding conditions shall be avoided.
- 7) Public access is restricted by signage, supervision, and/or physical barriers.

- 8) Employees are informed of the site safety plan and a record of employees is kept. Direct contact is to be avoided.
- 9) Trucks, storage tanks, and other exposed equipment to be used at other sites or for other activities are to be properly cleaned.
- 10) The water is not to be used for other processes.
- 11) Must contain 10 year 24 hour flood on site.

Constructed Open Water Conveyance Systems (except canals that have a designated use of DWS pursuant to R-18-11-104 et seq.)

Potential Exposure Pathways: Dermal; Body Contact; Inhalation Residential; Ingestion Residential; Wildlife; Groundwater; Surface Water

Risk Level: Residential risk factors.

Assumptions:

- 1) The resultant leachate will not cause the groundwater to exceed any applicable water quality standards.
- 2) Minimum depth to groundwater "x" feet
- 3) Limitations on physical characteristics of soil below constructed open water conveyance system.
- 4) Minimize aerosol effects at outfall .
- 5) Free-board capacity of "x" feet (i.e. flood protection)
- 6) Public access is restricted by signage, supervision, and/or physical barriers. Posted signs (e.g. "No swimming, fishing, drinking...").
- 7) End Use compliance point located at discharge to constructed open water conveyance system (No blending due to unpredictable nature of constructed open water conveyance system operation).

- 8) If the most sensitive application changes, then the standard may no longer be applicable. The standard shall be based on the most restrictive end use served by the constructed open water conveyance system.
- 9) Notification to users including notification of acceptable end users from other categories.
- 10) Fishing is not allowed in constructed open water conveyance systems. Thus, fish consumption is not assumed to be an exposure pathway in the development of the concentration levels.
- 11) Constructed open water conveyance systems are unlined.

Appendix 3

JENNINGS, STROUSS & SALMON, P.L.C.

MEMORANDUM

TO: Greg Witherspoon, Chair
End Use Subcommittee
Groundwater Cleanup Task Force

FROM: Shiela B. Schmidt

DATE: September 13, 1996

RE: End Use Subcommittee

I received your meeting notes summarizing the discussions held during the End Use Subcommittee meeting on September 10, 1996. Within your meeting notes, you have set forth two different liability options that will be presented for consideration by the Groundwater Cleanup Task Force during its meeting on September 19, 1996. As I indicated during the End Use Subcommittee on September 10, 1996, I believe that the stated objective to facilitate the transportation of remediated groundwater and provide liability protection for owners or operators of a constructed water conveyance system is necessary in order to encourage the owner or operator of a constructed water conveyance system to accept and transport, distribute or use the remediated water. However, as I also indicated during the End Use Subcommittee meeting on September 10, 1996, no definition for "remediated water" has been established in the context of the liability options nor has a definition of "remediated water" been established in the context of the development of presumptive end uses standards. Thus, support for these propositions may ultimately be affected depending upon the final definition of "remediated water."

I believe that any efforts to create statutory or regulatory obligations in the context of the development of presumptive end use standards or in the context of creating protection from liability should not impose liability on an owner or operator of a constructive water conveyance system where no liability previously existed. For example, the definition of "remediated water" must contemplate that the water has received some form of treatment approved by a remedial action plan or other applicable regulatory process. In addition, we should insure that whatever statutory language is drafted through our efforts will not be interpreted in the negative, thus imposing liability on one not fitting within the categories of the two options you have drafted.

Karen Gaylord and I are planning to have further discussions concerning these issues. However, I believe it is important for the Groundwater Cleanup Task Force to understand that these concerns exist and that these concerns should be addressed during the process as it moves forward.

COMMENT ON END-USE LIABILITY PROPOSALS

1. The Office of the Attorney General has concerns about the constitutionality of the proposal which states that a provider or user of remediated water is not liable for damages absent gross negligence or intentional conduct.

Article 18 § 6 of the Arizona Constitution states: "The right of action to recover damages for injuries shall never be abrogated, and the amount recovered shall not be subject to any statutory limitation."

This proposal changes the standard of recovery for damages from negligence to gross negligence. This appears to be an abrogation of the right, as victims of ordinary negligence would now be barred from bringing an action.

The Arizona Supreme Court has stated:

"The Legislature may regulate [a cause of action] so long as it leaves a claimant reasonable alternatives or choices which will enable him or her to bring the action." It may not, under the guise of "regulation" so affect the fundamental right to sue for damages as to effectively deprive the claimant of the ability to bring the action."

Barrio v. San Manuel Div. Hosp., 143 Ariz. 101, 106, 692 P.2d 280, 285 (1984).

In that case the court declared unconstitutional a statute which required a minor injured before the age of 7 to sue for such injuries before reaching age 10. The court held that abolishing a cause of action before it reasonably could be brought is an abrogation. The same principle was relied upon in *Kenyon v. Hammer*, 142 Ariz. 69, 688 P.2d 961 (1984).

The Supreme Court recently struck down as unconstitutional a statute which imposed a 12-year statute of repose in product liability actions, stating that:

"Section 12-551 goes far beyond merely "regulating" product liability actions that accrue more than twelve years after the product is first sold for use on consumption. Instead, claims such as the one under consideration are simply abolished *before* any injury occurs. This is an even more extreme form of abrogation than that condemned in *Barrio*." *Hazine v.*

Montgomery Elevator Co., 176 Ariz. 340, 343, 861 P.2d 625, 628 (1993).

This proposal abolishes a common law cause of action before it even occurs, and under the *Hazine* case appears to be an unconstitutional abrogation.


2. The concept within the second proposal, which states that water remediated pursuant to an approved R.A.P., consent decree or applicable standard shall be deemed safe, and the actions of the user or provider deemed as reasonable, is the establishment of a standard of care. While this concept has never been approved by an Arizona court, the Office of the Attorney General believes this concept has promise. It does not abrogate the right to bring action, and should therefore be constitutional.

7641

ADEQ
MEMORANDUM

DATE: September 17, 1996

TO: Greg Witherspoon, Chairman
End Use Subcommittee - GWCTF

FROM: Jim DuBois, Senior Tech. Adv. 
Water Protection Approvals & Permits

RE: Liability Options - Committee concerns to be included with
recommendation to full task force

=====

At our meeting on 9-10-96, a liability proposal was presented with two options to relieve end users of liability for damages from use of remediated groundwater. The group struggled with some of the concepts and decided to send the options up to the full task force with some concerns expressed. I would like to outline my concern that I expressed in the meeting regarding Option A, subsection 1, and Option B, subsection 3. I prepared the comments below to be included with the subcommittee's concerns on this liability issue:

Option A.1 and Option B.3. may not provide full coverage of potential impacts. Simply meeting a condition of complying with applicable state or federal standards is a very limited test of the potential impacts of an end use. There are some substances which may have a health impact or may cause other damages for which no water quality standards exist. A few examples of such substances are DDT, boron, MTBE, Total Petroleum Hydrocarbons, some polyaromatic hydrocarbons, sulfate, uranium. On the other hand, there are some standards that are set at higher levels than simple, health-based criteria would recommend, such as total trihalomethanes in drinking water. Thus, a stand-alone criteria of meeting standards without the full context of the RAP decisionmaking is not adequate to assure that all risks are "covered."

Secondly, providing liability exemption upon meeting standards alone could eventually lead to regulatory programs that default to a "meet standards and you're out" approach. How and where a standard is applied is often more important than the numeric level that is achieved. It is only through a technical review and approval process that proper decisions regarding applicability of standards can be made.

I would appreciate it if you could pass this information along for the full task force to consider. I understand that our limited time and mission as a subcommittee does not permit us to fully explore these details.

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Attachment

White Paper: ADEQ/ISDO analysis of database needs identified by the Groundwater Cleanup Task Force - Well Design and Use Subcommittee

Final - November 1996

Acknowledgments

The following individuals have participated in preparation of this Position Paper and their dedicated involvement in the Well Design and Use Subcommittee is greatly appreciated:

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Freddy Arteaga	Hydrology Support Service
Mike Ball	ADWR
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David Furrey	Flowing Wells Irrigation District
John Hathaway	ADEQ
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Lisa Jackson	ADWR-Phoenix AMA
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Eric Kamienski	City of Tempe
Keith Larson	City of Phoenix Water Services Dept.
Moses Olade	ADEQ
Kristine Palmisano	Dames & Moore, Graphics
Steve Ruppenthal	City of Goodyear
Andrew Stahl*	Valley Partnership/Dames & Moore
Brent Welker	Roosevelt Irrigation District/Burch & Cracchiolo
Kurt Zeppetello	Arizona Hydrological Society/ADEQ

The following individuals are acknowledged for attendance and contribution at Well Design and Use Subcommittee meetings:

<i>Contributor</i>	<i>Affiliation</i>
Karen Blue	Motorola
Harry Brown	City of Mesa
Clay Cady	Weber Environmental
Tom Conto	Cyprus Miami Mining
Bill Victor	Errol L. Montgomery & Associates
Eric Zugay	Basin & Range Hydrogeologists

* Subcommittee Chair

Acronyms and Abbreviations

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AMA	Active Management Area
ASLD	Arizona State Land Department
AZURITE	Arizona Unified Repository for the Informational Tracking of the Environment
FTE	Full-Time Employee
GPS	Global Positioning System
GWQ Database	Groundwater Quality Database
GWSI	Groundwater Site Inventory
RP	Responsible Party
SDW Database	Safe Drinking Water Database
Subcommittee	Well Design and Use Subcommittee
Task Force	Arizona Groundwater Cleanup Task Force
WQARF	Water Quality Assurance Revolving Fund

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believes these improvements will ultimately result in significant savings to the State of Arizona. Areas requiring funding for these recommendations should be implemented through the AZURITE program (see attached White Paper) and are as follows:

- Purchase of at least six additional GPS units for ADWR at \$500 each.
- Add approximately 10 to 15 FTEs for inputting ADEQ data.
- Add additional FTEs for ADWR's Basic Data and Records Management. The number of FTEs required could be reduced through electronic filing of applications and the standardization of paper applications and data forms to enable electronic scanning.

Although implementing these recommendations will incur some initial cost, much of the required materials and support are already in place:

- Currently, ADEQ and ADWR are both working on database development. The recommendations described above could easily be incorporated into the process with a mandate for interagency cooperation and communication in database development.
- ADEQ has already purchased Oracle 7. However, ADEQ upper management support is required to move ADEQ into the same software version for database design as ADWR.
- ADEQ has GPS training in place and may make this available to ADWR staff. Additionally, ADEQ is capable of performing the post-processing necessary for GPS data and would inherently have increased access to ADWR information through the process.
- ADWR currently has a scanner suitable for processing applications and historical documents.

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In summary, the Subcommittee makes the following specific recommendations to establish a state-wide well verification program:

- Fully integrate use of a GPS into ADWR well operations.
 - ▶ Mandate consistent use of GPS by ADWR and ADEQ in all daily field operations.
 - ▶ Make GPS units available at each AMA regional office and the ADWR Groundwater Management Support Section for use by staff.
 - ▶ Allow for addition of GPS information on well application forms.
 - ▶ Use current resources of ADEQ and other agencies for base station and post-processing of GPS information.
 - ▶ Pursue addition of DOD-linked GPS units for both agencies in areas of dense well spacing.
 - ▶ Pursue GPS cost-sharing mechanism with other state agencies that may also have precise location data needs, i.e., state land, state mining office.
- Establish a mechanism and policy for correcting ADWR's Wells-55 database with verified information and for exchanging the verified well location data between agencies.
 - ▶ Allow for coding of wells as "not found".
 - ▶ Provide efficient means to purge incorrect data from the database.

5.4 Financial Implications of Recommendations

Available technology can greatly increase the efficiency and accuracy of operations of the state agencies. Although initial funding will be required to implement the recommendations presented in this section, the Subcommittee

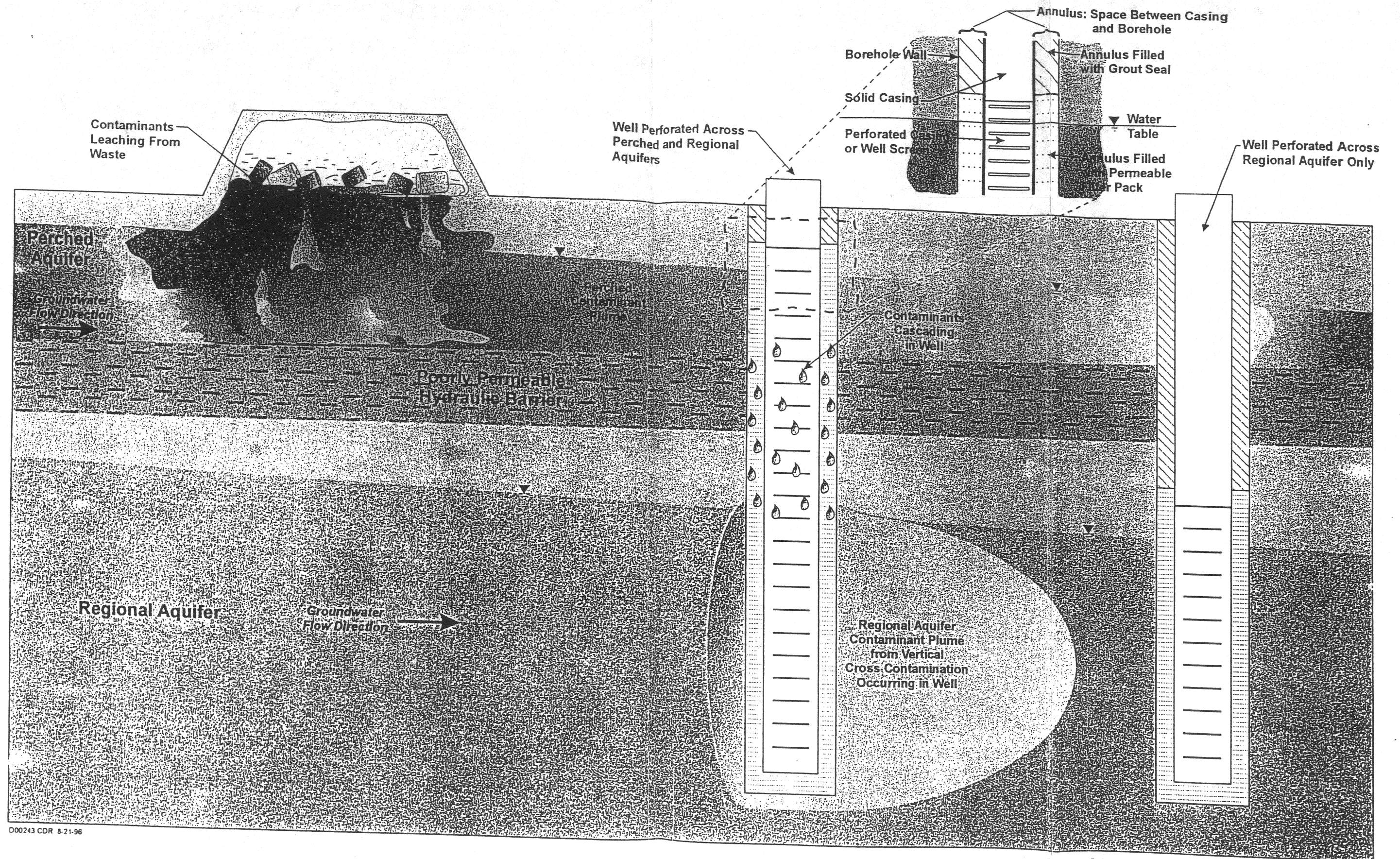
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Subcommittee recommends an on-going state-wide well verification program using, at a minimum, the resources of ADEQ and ADWR.

Critical to such a program is the full integration and use of GPS data into ADEQ and ADWR daily well operations, whether in application processing or field visits. GPS units should be purchased and readily available in all local offices, and use should be mandated as part of routine operations for field visits. ADWR AMA staff is currently required to perform site visits for all non-exempt well applications. An initial GPS reading could greatly increase the accuracy of the database and the information available to the public. Additionally, GPS readings of well locations should be standard practice for all other field visits by both ADEQ and ADWR, thus providing the opportunity for updating existing well location errors.

In order to expedite the full conversion of ADWR to a GPS system, ADEQ has the capability not only of training ADWR staff, but has offered to post-process ADWR-collected GPS information. ADEQ also has a base station available for use to increase the accuracy of readings. The Subcommittee further recommends pursuing the addition of U.S. Department of Defense-linked units for both agencies for use in areas of dense well spacing. The U.S. Department of Agriculture is currently the "vendor" for these units, and there exists the possibility of purchasing such units through the U.S. Geologic Survey's Water Resource Office.

Equally important to the establishment of a well verification program is the need to mandate the development and implementation of policy and procedures for correcting ADWR's Wells-55 database with verified information. Changes to this database have been limited to those submitted by the actual owner. However, with a well verification program, accurate information may be gathered by a variety of sources. In addition to incorrect well locations, the Wells-55 database frequently lists wells as "active" that are not found by field inspection. The developing database should allow for information such as "not found" to be entered directly, as well as a method for purging incorrect data. As new information is submitted, procedures should be in place to inform the well owner and to extend the opportunity for the owner to approve the new information before the database is updated.



D00243 CDR 8-21-96

How Vertical Cross Contamination Occurs in Wells

Well Design and Use Subcommittee of the Groundwater Cleanup Task Force

Figure 1

The Subcommittee recommends improved public access to the agencies' existing and future database systems. Terminals should be required for public access in outlying areas, as well as through the Internet. Both agencies should proceed with analyzing these possibilities and potential problems of direct on-line access. Along with on-line access, the Subcommittee recommends proceeding with agency-wide electronic filing of applications and the standardization of paper applications and data forms to enable electronic scanning. Not only will electronic filing reduce cost to the agency and the regulated community, but will increase efficiency and reduce errors. A pricing policy for electronic data requests may be appropriate.

In summary, the Subcommittee makes the following specific recommendations to establish ADWR-ADEQ interagency coordination and database management that will ultimately result in a cohesive, unified, linked system:

- Immediately upgrade both agencies to the same version of Oracle software (version 7.0).
- Establish a policy in both agencies for electronic filing of applications and the standardization of paper applications and data forms to enable electronic scanning.
- Add additional long-term full time employees at both agencies for database upgrade (data entry).
- Increase public access to data through remote office terminals and Internet.
- Where possible, link ADEQ drinking water database and groundwater quality database.

5.3.2 State-Wide Well Verification Program

As stated previously, the current ADWR database contains many errors regarding well location. This greatly impacts not only ADWR and ADEQ, but many aspects of groundwater cleanup and well permitting. Therefore, the

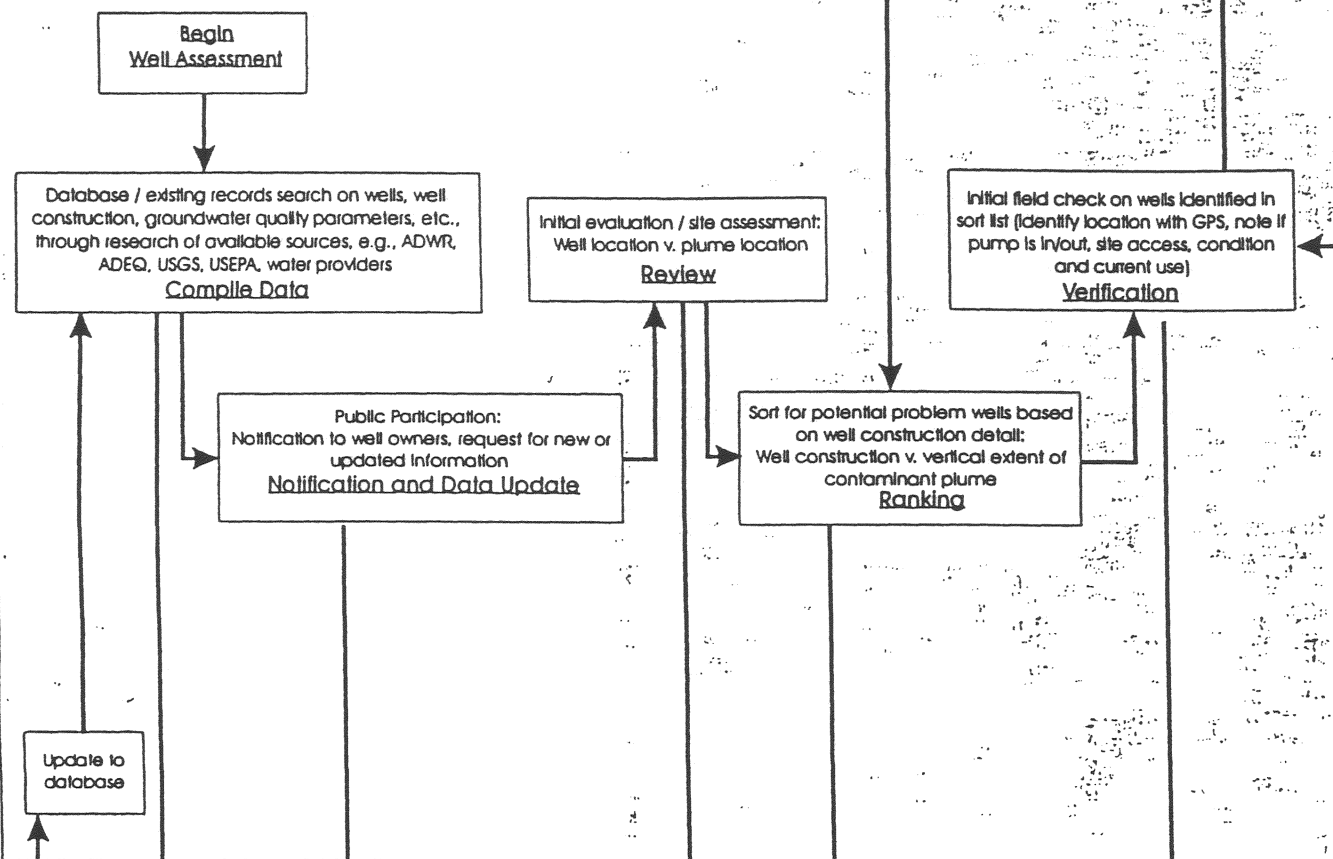
5.3.1 Interagency Coordination of Databases

The Subcommittee strongly recommends enhancing interagency database coordination and management with the ultimate end result being a directly linked systems. This should result in a dramatic increase in efficiency and accuracy of information gathering and sharing activities performed by the agencies and the regulated community. The existing means of data exchange between the two agencies is through periodic data "dumps". Unfortunately, this does not adequately meet the immediate needs of either regulatory agency or the public. ADEQ and ADWR are both reviewing database needs as well as designing new systems. As these developments continue, it is imperative that the agencies interact to jointly develop their systems. This interaction will lay the groundwork for a direct on-line linkage between the systems, rather than only meeting the agencies' individual needs.

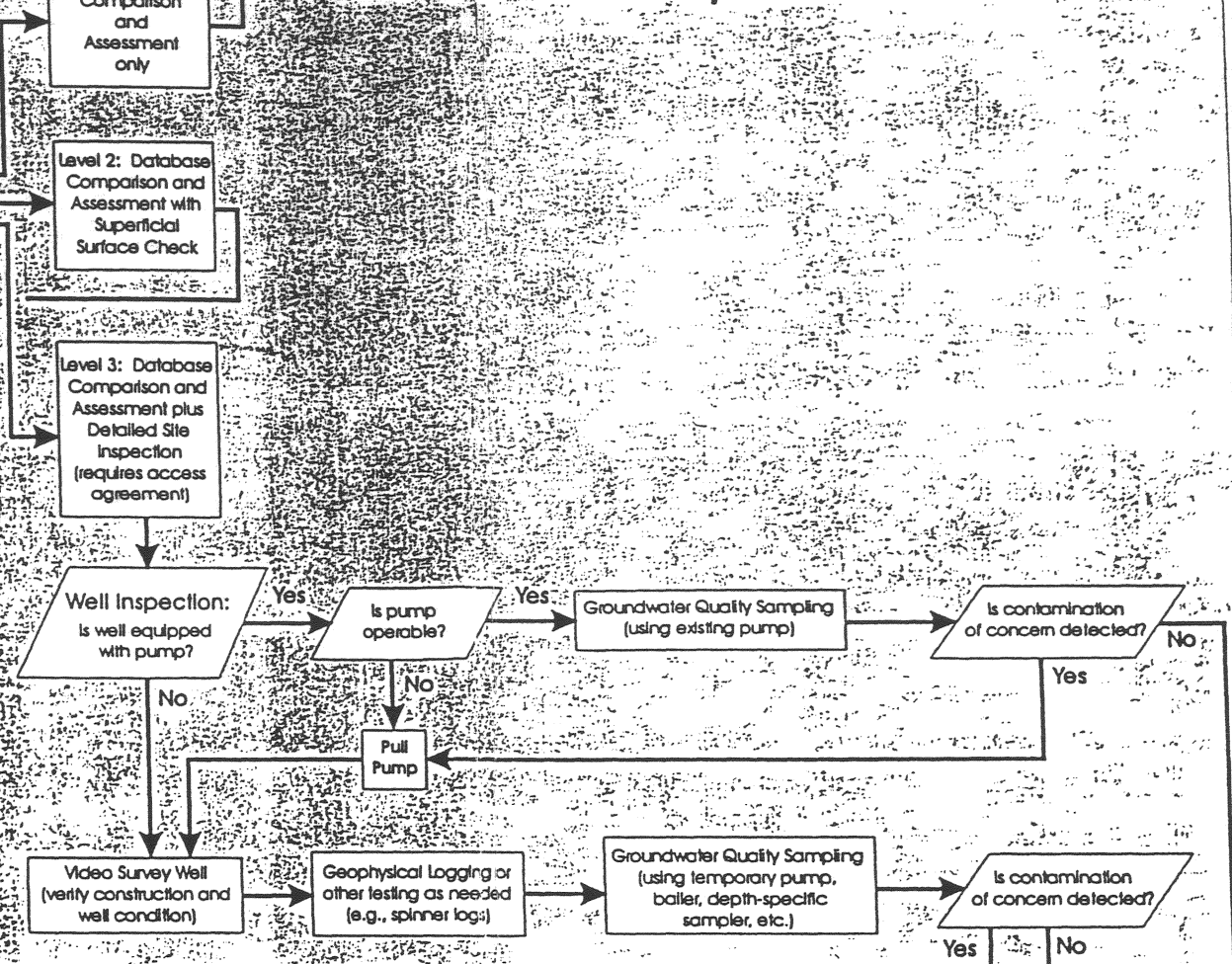
The Subcommittee has found that the ADWR and ADEQ both appear to be moving toward an Oracle system using BROWSER for query activities. Currently, ADWR is designing its system with Oracle 7. Although ADEQ possesses Oracle 7, upper management has not given its support for database development with this software. The Task Force should request that ADEQ upper management support database development with Oracle 7. Additionally, the Subcommittee recommends that a direct link be created between ADEQ's two primary databases. With this link, new wellhead data would immediately be reflected in the Groundwater Quality Database in addition to the Safe Drinking Water Database.

Both agencies have a large amount of data currently existing only on hard copy. These data include driller's logs, water quality data, and other data critical to groundwater cleanup studies. This limitation greatly increases the cost and time spent by state employees and the public in researching well information and hinders public access in outlying areas. The Subcommittee recommends the addition of full-time employees (FTEs) to each agency. These FTEs will be dedicated to inputting hard copy files into the agencies' databases. The Task Force also should request that ADEQ develop a policy of entering data into ADEQ's system upon receipt.

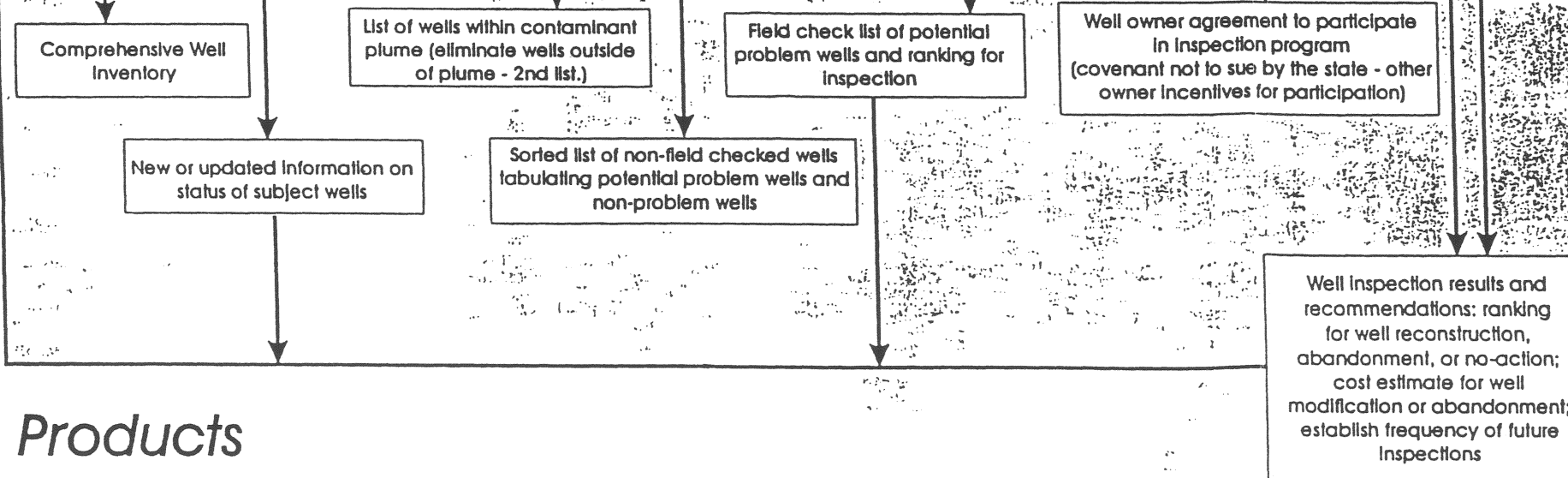
Action: Well Assessment



Action: Well Inspection



Products



one (or none) of these matching the actual well location. These 'ghost' wells continue to take up space in the existing databases, and cost time and expense to the government and private users of water well data who unsuccessfully attempt to locate and sample nonexistent wells. There is currently no mechanism to correct database discrepancies as verifying data are obtained by other agencies or private firms.

5.2.5 Insufficient Communication Between State Agencies

In the past, communication between agencies regarding water well and water quality information has been intermittent, leading to duplicated data collection efforts and a lack of efficient use of each other's data resources. Through the efforts of this Subcommittee, the ADWR first became aware that the location data and registration numbers for approximately eight percent of the 110,000 wells in ADWR's Wells-55 database have been verified by ADEQ through a program designed to cross-correlate the ADWR information with ADEQ's GWQ database. The ADEQ has now provided the verified data to the ADWR. Neither agency was previously aware of the magnitude of overlap in their respective databases.

5.2.6 Insufficient Human Resources for Initial Data Entry and Verification

Although maintenance of an improved database system might not require additional state agency staff, initial data entry and well location verification will require the efforts of an estimated 10 individuals working with both the ADEQ and ADWR.

5.3 Discussion of Recommendations

The Groundwater Cleanup Task Force believes that the following recommendations should be implemented through the Arizona Unified Repository for the Informational Tracking of the Environment (AZURITE) program (see attached White Paper).

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5.2.2 Lack of Centralized, Linked Access to Existing Data Sources for Water Well Data

Data regarding depth to groundwater, water quality, and well location, depth, construction specification, use, ownership, etc. currently exist in numerous isolated locations. These locations include the four databases discussed above, databases maintained by other state agencies such as the ASLD, and a wealth of water quality and other monitoring data presented to the ADEQ in the form of written reports by municipalities, other state agencies, consulting firms, and the general public. Overlapping efforts and duplicated information are commonly produced by state agencies, municipal water suppliers, and consulting firms because of the current lack of a centralized database by which all such information is eventually linked. The potential cost and time savings for generators, users, and evaluators of water well and water quality data would be very large if a unified database (linked between agencies) or at least a centralized location (physical or virtual) where the relevant databases could be readily accessed by public and private concerns were available. A single redundant groundwater monitoring event or wasted correlation of preexisting data sets can translate into tens of thousands of wasted public and/or private dollars. The information in the existing databases suggest that such redundant and wasted efforts are frequent.

5.2.3 Inconsistent Database Formats

The ADWR is currently making efforts to integrate its databases into the new Oracle 7 BROWSER-based database software. The ADEQ GWQ database exists in Oracle 6, which is not directly accessible using Oracle 7. The GWQ database has the potential to upgrade to Oracle 7, but necessary approval to implement this upgrade has not been granted.

5.2.4 No Mechanism Currently Exists for Efficient or Consistent Data Verification or Correction

There is currently no established mechanism to systematically verify and/or correct potentially erroneous well location and registration data. For this reason, multiple registration numbers exist for many wells, with perhaps only

5.2 Discussion of Existing Problems

There are several problems with the existing water well and water quality databases that make data evaluation unnecessarily challenging and make access to available data cumbersome, inefficient, and costly to government, industry, and the general public. The primary problems, as identified by the Subcommittee, are as follows:

5.2.1 Existing Databases are not Linked and Contain Inconsistent and/or Duplicate Information

Currently, the ADWR maintains two separate databases containing water well information. The older GWSI database consists of historical hard-copy data files from the Arizona State Land Department (ASLD) and Water Commission logs, and electronic data collected during field visits performed by the Basic Data Section of the ADWR. The locations of most, if not all, of the wells in this database reportedly have been verified/field checked for accuracy. The more recent Wells-55 database maintained by the ADWR contains registered wells and is computer-based. Approximately two percent of these wells have reportedly been field checked for accuracy of locations. The Wells-55 database has not been correlated with the GWSI database. As a result, an unknown number of duplicate entries and potentially inaccurate locations currently exist in the computer database.

The ADEQ maintains two primary water well/water quality databases, the GWQ and SDW databases. The GWQ database contains well locations and water quality data for approximately 50,000 wells in Arizona, approximately 10,000 of which reportedly have been field checked with respect to location (using GPS technology) and linked with their Wells-55 registration numbers. The SDW database has not been linked with either the GWQ database or the Wells-55 database.

5.0 Database Needs

5.1 Background

Virtually all effective, efficient, and successful groundwater quality investigations in Arizona must rely on the use of databases maintained by the ADEQ and ADWR. These databases typically include groundwater quality information, well location, well construction and water level data, as well as geologic and hydrologic information. The data and database systems are fundamental to all regulatory permitting processes. As a result, the accuracy of the data, ease of access, maintenance, and management of these databases have a direct impact on all regulators, well owners, consultant groups, and concerned citizens relying on these information systems.

The Subcommittee has focused on several significant problems that have become apparent after years of operational experience with the existing water well and water quality database systems. These obstacles limit the usefulness of the databases, and the Subcommittee recommends specific action to correct these problems. The existing databases of interest are:

- ADWR Groundwater Site Inventory (GWSI) - Contains groundwater data from wells monitored state-wide by ADWR's Basic Data Group (not all wells in this database are registered).
- ADWR Wells-55 Database - Contains groundwater wells registered state-wide with the ADWR.
- ADEQ Groundwater Quality (GWQ) Database - Includes monitoring-well latitude, longitude, and water quality data.
- ADEQ Safe Drinking Water (SDW) Database - Compliance database from regulated entities (water providers).
- ADEQ has several other databases, although the SDW and GWQ databases have most of the information pertinent to the issues address by this Subcommittee.

- **Well Modification**

The cost for well modification is expected to be well-site dependent. Modifications may include insertion of new liner or packers, deepening the well, repacking with gravel, resealing with bentonite or cement grout, and more.

- ▶ Domestic Well
(6 inch diameter, 200 feet deep): \$10,000
- ▶ Small Agricultural Well
(10 inch diameter, 250 feet deep): \$25,000
- ▶ Large Municipal /Industrial/Agricultural Well
(20 inch diameter, 800 feet deep): \$150,000+

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- **Inspection Scenario 3**
 - ▶ Estimated Cost: \$90,000
 - ▶ Cost estimate includes:
 - sample collected from pump discharge
 - analytical laboratory cost
 - pull and reinstall pump
 - downhole well video log
 - well cleaning needed
 - geophysical logging
 - pump replacement
 - operational testing
 - ▶ Assumptions
 - agricultural/municipal/industrial well
 - 20-inch diameter
 - 800 feet deep
 - 10-inch pump set at 450 feet
 - no information available
 - comprehensive suite of water quality analyses desired
 - operable pump in well
 - high difficulty of pump removal
 - pump destroyed on removal
- **Well Abandonment by Sealing Well with Bentonite or Cement Grout**
 - ▶ Domestic Well
(6 inch diameter, 200 feet deep): \$8,000
 - ▶ Small Agricultural Well
(10 inch diameter, 250 feet deep): \$12,000
 - ▶ Large Municipal/Industrial/Agricultural Well
(20 inch diameter, 800 feet deep): \$25,000+

- **Inspection Scenario 1**
 - ▶ Estimated Cost: \$7,000
 - ▶ Cost estimate includes:
 - sample collected from pump discharge
 - analytical laboratory cost
 - pull and reinstall pump
 - downhole well video log
 - operational testing
 - ▶ Assumptions:
 - domestic well
 - 6-inch diameter
 - 200 feet deep
 - no information available
 - comprehensive suite of water quality analyses desired
 - operable pump in well
 - moderate difficulty of pump removal

- **Inspection Scenario 2**
 - ▶ Estimated Cost: \$12,000
 - ▶ Cost estimate includes:
 - sample collected from pump discharge
 - analytical laboratory cost
 - pull and reinstall pump
 - downhole well video log
 - operational testing
 - ▶ Assumptions
 - agricultural/municipal/industrial well
 - 20-inch diameter
 - 800 feet deep
 - 10-inch pump set at 450 feet
 - no information available
 - comprehensive suite of water quality analyses desired
 - operable pump in well
 - low difficulty of pump removal

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- The well owner/user shall be exempt from any form of liability as an RP for secondary contaminant discharge (covenant not to sue by the State).
- To clarify the waiver or variance procedure available to applicants under A.A.C. R12-15-820 regarding upgrade to minimum construction standards, ADWR should provide written guidelines, perhaps in the form of a Director's policy statement, to applicants seeking waivers.
- The well owner/user shall be provided with expedited completion of well reconstruction or replacement activities, so as to mitigate any losses in production.

4.2 Financial Implications of Recommendations

To assist the Task Force in their consideration of these recommendations, the Subcommittee has assembled cost estimates for three well inspection scenarios, three well abandonment scenarios, and three well modification scenarios. These estimates are derived from recent project costs incurred by water providers and state agencies from similar projects. The Subcommittee anticipates a low potential for small-diameter, shallow domestic and agricultural wells to be significant conduits for spreading contamination and recognizes that larger-diameter, deeper wells that are perforated across multiple aquifer units have the greatest potential for cross-contamination. This inferred limitation should be taken into account when evaluating the following cost estimates.

following incentives to promote cooperation of well owners and users in this program:

- ▶ **Notification:** Establish and maintain communication with well owners and well users throughout the well inspection process. Well owners should be given opportunities throughout the process to review all workplans and provide input. Well owners will receive all new information regarding their well generated from the inspection activities.
- ▶ **Access:** Access to private property should involve negotiation with the well owners. Entry to the well site for inspection activities should be governed by an access agreement that states the responsibilities and liabilities of all parties.
- ▶ **Funding:** Funding for well inspections and for the cost of well rehabilitation or abandonment should be provided by the RP(s), the WQARF fund, or the facility owner(s)/operator(s) responsible for the primary discharge of contamination.
- ▶ **Compensation:** Well owners should be made whole for loss of production from a well due to abandonment or reconstruction. Compensation should be provided by the RP(s), the WQARF fund, or the facility owner(s)/operator(s) responsible for the primary discharge of contamination.

For cooperating with the well inspection program and reducing the risk of cross-contamination of aquifers, the following shall apply to well owners/users:

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- ADEQ or ADWR, or both, should be required to establish and maintain communication with well owners and users throughout the well inspection process. Well owners and users must be given opportunities throughout the process to review the evaluation process and to provide input. Well inspections must be coordinated with well owners, to minimize impacts to well operations and water delivery requirements.
- There is disagreement whether well owners should be named as RPs for secondary contaminant discharge. A covenant not to sue by the State should be established for well owners and users so they can not be named as RPs for secondary contaminant discharge, provided they cooperate with the well inspection program and efforts to mitigate the cross contamination problem in their well to the extent possible and consistent with their water delivery responsibilities and system operation requirements. ADEQ and/or ADWR should develop appropriate terms and conditions for the covenant not to sue by the State. There should be some discretion to withhold issuance of a covenant not to sue by the State or to qualify an agreement in appropriate cases where a well owner had actual knowledge of groundwater contamination and constructed a well in violation of law, resulting in cross contamination of an aquifer.
- Well inspections must be done at no cost to well users or well owners that are not identified as an RP or identified as a facility owner/operator responsible for the primary discharge of contaminants. Wells that require modification because well inspection has identified them to be contributing to the spread of contamination must be modified or abandoned at no cost to well users or to the well owners described above.
- The cooperation of well owners/users is essential to the success of the well inspection program. The Subcommittee recommends the

4.0 Identifying and Mitigating Vertical Cross Contamination in Existing Wells

4.1 Discussion of Recommendations

To identify and mitigate vertical cross contamination in existing wells, the Subcommittee makes the following recommendations:

- A process should be established to rank existing wells within a WQARF site, or other groundwater contaminant sites listed in Section 2.1, according to their potential to act as a conduit to spread contamination. Ranking criteria should be compiled initially from existing database information and should include an assessment of whether the well is located inside or outside of the contaminant plume, whether the well casing is perforated across multiple aquifers or aquifer zones, and whether one or more of these aquifers or aquifer zones are contaminated.
- A well inspection program should be developed for wells that are identified to have a moderate to high potential of acting as a conduit to spread contamination. The inspection program must facilitate levels of inspections with the scope of each level appropriately correlated to the assessed potential for the well to be spreading contamination. A well inspection must start with the most simple, cost effective methods and progress to more extensive and expensive methods only if justified by the earlier inspection results. The level of inspection required must be determined on a well-by-well basis. Costs for well inspections will vary greatly and are dependent on well location, well construction, and the method of inspection. Details of the proposed well inspection program are outlined on the flow chart presented as Figure 2.

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The recommended contamination review process should not be allowed to further expand this time period. The 15-day review period, established pursuant to Arizona Revised Statute § 45-596(D), for notices of intent to drill should not be extended. A system for applicants to track or monitor the notice or application during the review process should be established.

- Funding for ADWR may be required for additional staff to ensure that application and well design review does not result in delay to the applicant. Some increase in the fees required for a notice or application may be appropriate. Any such increase should be placed in a separate ADWR fund and not merely forwarded to the State general fund. Additional funding also may be required to accommodate database development and purchase of GPS equipment. These related recommendations are presented in more detail in Section 5.0.

3.0 Preventing Vertical Cross Contamination in New Wells

To prevent vertical cross contamination in new wells, the Subcommittee makes the following recommendations relating to the process of applying for an ADWR permit to drill new wells:

- Each notice or application form should include space for ADWR staff to indicate whether the proposed well site is included within an area of known groundwater contamination (e.g., WQARF sites). Staff shall make that determination after a review of the water quality data base (see Section 5.0). Further, the form should contain language placing the applicant on notice that placement of a well in a known area of contamination will likely require the well owner to design and construct the proposed well in a manner that will prevent vertical cross contamination as authorized by the ADWR Director in A.A.C. R12-15-821. The applicant then may be required to submit well design plans to ADWR for review and approval.
- For those notices or applications submitted for wells located in an area of known groundwater contamination, each notice or application form should include space for staff to indicate that the proposed well design has been approved by staff.
- Each notice or application should include space for a GPS reading for the well site. Approval of the notice or application should not be conditioned on provision of the GPS reading by the applicant. However, as discussed in detail in Section 5.3.2, funding should be provided to ADWR for purchase of GPS equipment to maximize gathering of the GPS data.
- In requiring additional review of applications relative to contamination issues, there should be no resulting delay to applicants. Currently, applications for production wells within an Active Management Area (AMA) take approximately two months to process.

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integral and necessary steps toward improving groundwater cleanup procedures in Arizona:

- Establish ADWR-ADEQ interagency coordination and database management that will ultimately result in a cohesive, unified, linked system.
- Establish a state-wide well verification program using resources from both ADWR and ADEQ by:
 - ▶ Fully integrating the use of a Global Positioning System (GPS) into ADWR and ADEQ operations.
 - ▶ Establishing a mechanism and policy allowing for amending well locations and other information in the ADWR database and the exchange of verified well location data between agencies.

2.3 Identifying and Mitigating Vertical Cross Contamination in Existing Wells

A well inspection program is recommended to identify and mitigate vertical cross contamination in existing wells. The program should be designed to first rank wells according to their potential to act as conduits for spreading contamination. Only those wells with a high probability for spreading contamination will be further inspected. The major features of the inspection program include:

- Review and assess existing data to eliminate wells outside the contamination plume or wells that are unlikely to spread contamination.
- Provide well owner incentives for participating in the inspection program.
- Inspect potential conduit wells to make recommendations for well reconstruction, well abandonment, or no action.
- Provide assured funding (Responsible Party (RP), WQARF, or facility owner/operator responsible for the primary discharge of contamination) for well inspection, well modification, well abandonment, and supplemental/replacement water supplies.

2.4 Database Needs

An important stumbling block of the current groundwater cleanup system is the lack of database integration between the two primary state water regulatory agencies: the ADWR and the ADEQ. Frequently, the agencies and public do not have adequate access to existing data, or the data are incorrect or incomplete. The Subcommittee recommends the following as

2.0 Summary of Recommendations

2.1 Addressing Vertical Cross Contamination as a Matter of Arizona State Law

The Subcommittee recommends that properly addressing vertical cross contamination within groundwater contamination plumes be a matter of state law. It is not the intention that a new regulatory program be established to administer the recommended state law. Rather, the Subcommittee recommends that the statutes and/or rules for each of the following existing ADEQ programs be amended or modified so that they are consistent in addressing vertical cross contamination: Water Quality Assurance Revolving Fund (WQARF), Resource Conservation and Recovery Act hazardous waste and solid waste programs, Special Waste Management program, Underground Storage Tank program, and the Aquifer Protection Permit program. It is anticipated that the federal Superfund program will be consistent with these ADEQ programs because the state law requirements should be considered Applicable or Relevant and Appropriate Requirements (ARARs) for purposes of addressing vertical cross contamination under the federal Superfund program. Furthermore, a statutory definition of "vertical cross contamination" should be adopted.

2.2 Preventing Vertical Cross Contamination in New Wells

Approval from the ADWR is required before a well can be drilled in Arizona. To prevent vertical cross contamination in new wells, the ADWR drilling approval process should be modified to incorporate further review relative to potential contamination. That review should identify wells being placed in areas of known contamination and should ensure that well designs in such areas utilize design constraints to avoid vertical cross contamination. It is not intended that this review delay the time required to process applications or notices of intent to drill.

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to spread to deeper horizons of aquifers much slower, if at all, compared to their rate of lateral migration. Unfortunately, idle wells that have permeable or absent annular material or are otherwise screened across both shallow and deep aquifer horizons can hasten the vertical spreading of shallow groundwater contaminants. Given a downward hydraulic gradient, these wells provide a direct conduit for contaminant flow thus bypassing the typical geologic and hydraulic factors that would preclude vertical cross contamination or otherwise inhibit the establishment of a deeper groundwater contaminant plume.

also can occur in non-perched aquifer systems, as is discussed at the end of this section. Generally, vertical cross contamination can occur only in wells that are not operated continuously. This is because contaminants entering an actively-pumped well from a particular aquifer or aquifer zone are withdrawn along with the discharged groundwater thus precluding their migration to a different level in the well.

A poorly permeable geologic formation, as depicted on Figure 1, can act as a hydraulic barrier that perches groundwater at some elevation above an underlying main body of groundwater. If not properly constructed, a well drilled through this hydraulic barrier may create a conduit for perched groundwater to migrate to the deeper regional aquifer. The perched groundwater can migrate downward through an open annulus (space between the well casing and the borehole) or through permeable annular backfill material, or can cascade to the deeper aquifer inside the well casing after passing through the perforations in the casing or through the openings of a well screen (see Figure 1 for well construction details). This downward migration of perched groundwater can be prevented by installing solid casing across the perched aquifer and sealing the annulus with an impermeable material such as a cement grout.

The mechanism for downward groundwater migration described in the preceding paragraph can lead to cross contamination of a deeper regional aquifer if there is perched pure-product contamination and/or contaminants dissolved in perched groundwater. As illustrated in Figure 1, vertical cross contamination could create a groundwater contaminant plume in an otherwise unaffected regional aquifer.

Vertical cross contamination also can occur within a single aquifer with no perching hydraulic barrier. This can occur with or without wells acting as a vertical conduit. Fortunately, due to various geologic and hydraulic factors, the magnitude of vertical groundwater flow is usually small and dominated by the horizontal component of groundwater flow. Therefore, in the absence of wells acting as a vertical conduit, shallow groundwater contaminants tend

Department of Environmental Quality (ADEQ) has the responsibility for protecting the state's aquifers from degradation as well as ensuring the quality of water served for human consumption. This division of responsibilities must be properly coordinated, no small challenge when the legal mandates of each Department may be in seeming opposition—water supply versus water quality; beneficial use versus pumping for treatment purposes alone.

Another conflict arises when a well owner is unwittingly involved in groundwater contamination because a contaminant initially released by someone else vertically migrates in a well. If the well needs to be modified or abandoned and there is no assured funding for these activities, the matter drifts perilously close to the profound words of the Bill of Rights, “[N]or shall private property be taken for public use without just compensation.”

The Subcommittee recognizes the overlap between the matter of wells acting as conduits for spreading contamination and the work of several of the other subcommittees established by the Task Force. Notable among these overlapping subcommittees are Remedy Selection, Funding, and End Use. The early work of the Well Design and Use Subcommittee rapidly expanded to make sure that its recommendations would be compatible with the work of the other groups and that key details would not emerge that would render its recommendations unworkable. The Task Force provided guidance to the Subcommittee so that it could focus its work on specific recommendations that would fit within the context of the larger work. Recognition of the intertwining nature of the various components of the larger questions have helped ensure the success of the Task Force's work.

1.2 How Vertical Cross Contamination Occurs in Wells

Vertical cross contamination is the spreading of contaminants from a shallow aquifer to a deeper one or from one horizon of an aquifer to another. Figure 1 illustrates how cross contamination occurs in wells that penetrate both a perched aquifer and a deeper regional aquifer. Vertical cross contamination

1.1 Overview of the Issues

The passage of Arizona's Groundwater Management Act in 1980 served to reemphasize that Arizona's groundwater is not a limitless resource. Over the previous years, and even today, groundwater pumping can be considered a mining activity because the water underlying our state represents hundreds or even thousands of years of stored precipitation that is being extracted over a few decades. Federal legislation authorizing the construction of the Central Arizona Project as an alternative surface water source was partially based on the maturing view that groundwater, particularly for areas with high water demand, must be protected and reserved as an emergency water supply to carry us through times of drought or interruption of surface water supplies.

Fifteen years of experience with Superfund groundwater cleanups has taught us that, not only can remediation of contaminated aquifers be an expensive proposition, but that it is all too often an impractical if not impossible task. We have also learned that otherwise innocuous wells can act as vertical conduits for spreading contamination from one aquifer to another or from one portion of an aquifer to another (i.e., vertical cross contamination). If the well owner is a water provider for others, especially of domestic drinking water, there arises a conflict between the desire to protect the resource for the long term and the immediate need to fulfill the demand of customers. The proposition of shutting down a production well as part of a groundwater investigation or remediation is sure to cause grave concern for any water provider. Simply finding an alternative well site is not enough. Water distribution and delivery systems are designed and built around the water supply and demand. Moving the point of supply is likely to be incompatible with pumping systems, pipe networks, reservoirs, and pressure zones. Meanwhile, contamination may spread while faucets run dry.

The Arizona Department of Water Resources (ADWR) is charged with the responsibility of planning and regulating the use of the state's groundwater. Their responsibility includes a certain level of authority for well design and construction to prevent cross contamination of aquifers. The Arizona

1.0 Introduction

The Well Design and Use Subcommittee (Subcommittee) was established by the Arizona Groundwater Cleanup Task Force (Task Force). The Subcommittee has focused its efforts toward making recommendations regarding vertical cross contamination, which is the spreading of contaminants from a shallow aquifer to a deeper one or from one horizon of an aquifer to another. This Position Paper presents the Subcommittee's recommendations on the following topics:

- Addressing vertical cross contamination as a matter of state law.
- Preventing vertical cross contamination in new wells.
- Identifying and mitigating vertical cross contamination in existing wells.
- Improving the accuracy of data and access to database systems in order to effectively mitigate and prevent vertical cross contamination.

The remainder of this introduction presents an overview of the issues and an explanation of how vertical cross contamination occurs in wells. Section 2.0 of this paper presents a summary of the Subcommittee's recommendations. Sections 3.0 through 5.0 provide expanded discussions regarding these topics. The Subcommittee requests that the Task Force consider these recommendations with the objective of forwarding them to the Legislative Joint Select Committee established to address issues related to groundwater contamination and cleanup. If accepted by the Joint Select Committee, the Well Design and Use Subcommittee recommends that a qualified team be established to assist in drafting appropriate statutory and/or regulatory language.

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POSITION PAPER

WELL DESIGN AND USE SUBCOMMITTEE
Groundwater Cleanup Task Force

November 1996



Dave Kempson, Manager
ADEQ Information Systems Development Office



October 24, 1996

ADEQ/ISDO analysis of database needs identified by the Groundwater
Cleanup task force - Well Design and Use Subcommittee

White Paper



Introduction



ISDO/AZURITE Background



Analysis of Issues Outlined in the
Well Use & Design Subcommittee Report



Financial Analysis



Proposal



Conclusion

ADEQ/ISDO analysis of database needs identified by the Groundwater
Cleanup task force - Well Design and Use Subcommittee

White Paper:



Dave Kempson, Manager
ADEQ Information Systems Development Office



October 24, 1996



Introduction

The Well Use and Design Subcommittee (WUDS) of the Arizona Groundwater Task Force recently released a draft report which outlined database issues and needs associated with water quality data maintained by ADEQ and ADWR. In a meeting, shortly following the release of this report, ADEQ's Water Quality Division Director, Kim MacEachern, provided a summary of ADEQ's database development efforts, i.e., ISDO and AZURITE. She stated that the need for information systems was a cross cutting, department wide issue and was not limited to groundwater data. She further explained that ADEQ is taking a global approach to information management and is designing a solution with the flexibility to address all information systems' (IS) needs.

Committee members representing both the general public and the regulated community expressed an interest in learning more about ADEQ's efforts. They unanimously agreed that information management is a high priority. They suggested that a special appropriation might be sought to fund AZURITE or a similar project for the purpose of addressing these high priority issues.

Based upon these discussions, Ms. MacEachern asked that I prepare a white paper which addresses these issues and outlines a proposal for additional funding by appropriation.

ISDO is actively seeking out and pursuing other funding alternatives in an effort to reduce the existing burden on both the indirect rate and divisional staffing. Federal and State level grant programs are being examined for applicability. If ISDO is awarded grant money, the resultant impact will be a lessened burden on the indirect rate.

Another funding alternative would be to seek a special legislative appropriation. While monies of this type are extremely hard to obtain, it would be a strong possibility if AZURITE had universal support from both the general public and the regulated community. To date, ISDO has been focusing on internal outreach and education regarding AZURITE and has not actively engaged in significant external outreach. However, through day to day communication and response to inquiries, ISDO has had an opportunity to share their plan with some external customers. Their response has been one of universal acceptance along with a sense of urgency. This level of enthusiasm may be indicative of a high level of legislative support should AZURITE be presented. The proposal below outlines ISDO's position regarding the appropriateness and timing associated with seeking a special appropriation.

Proposal

In the shadow of failed Information System projects, such as the ADOT Project Enterprise and the Maricopa County Hospital Information System, the legislature is sensitized to the risks associated with poorly designed, badly managed, IS development projects. The recent creation of the Government Information Technology Agency (GITA) and the associated project justification requirements are an indication of this concern.

It is unlikely that a high risk project would receive approval for special appropriation. A low risk, cost effective project would be a likely candidate for funding if it was endorsed by GITA and if it had a high degree of external customer support. The key then is for ADEQ to pursue a GITA endorsement, to minimize the risk associated with the project and to educate external customers on the potential benefits of the AZURITE system. The timely and appropriate approach to the legislature regarding an appropriation would be after these three key issues are met.

Currently, ISDO is working on meeting the first two issues. A GITA project justification is being prepared with the intent of pursuing endorsement before the justification requirements become effective. The project risk is being reduced through proactive project management and the demonstration of "proof of concept" at each project phase. Special appropriation would more likely occur after a GITA endorsement is received and after development and implementation of the principal databases. Successful design, development and implementation of the principal databases will serve as proof of concept of the AZURITE plan and demonstrate the capabilities of the project management and staff. Success in this first important stage of the process will demonstrate the likelihood of success in subsequent phases and therefore a low risk for additional funding.

The third key issue, educating external stakeholders, is an ongoing issue. Currently, external stakeholders are anxious for improved access to ADEQ information, and are enticed by the notion of an integrated network of systems. I believe, however, that their confidence level is low that ADEQ will be able to make significant advancement given that we have not shown any movement in that direction. ADEQ must proactively manage the expectations of the public and ensure that Information System issues are being addressed to earn the respect and confidence of our customers. Once the first phase of development is complete, ADEQ will proactively conduct outreach to communicate its success; external stakeholders will be involved in the design and development process and their needs addressed. If ADEQ is successful in this effort then the likelihood of receiving a special appropriation is high.

Time will be required for ISDO to pursue external outreach, to demonstrate "proof of concept," and to receive GITA approval. ISDO will address these issues between now and the end of its two-year charter (December 31, 1997). This would be the appropriate time to pursue a special legislative appropriation. However, since the budget process for FY98 is already in full swing, the best alternative would be to submit a budget request for FY99.

future needs and are independent of organizational structure.⁵

Overall, the analysis and recommendations represented in the WUDS report are consistent with those prepared by ISDO. WUDS independent validation provides additional justification for ADEQ's implementation of the AZURITE strategy. The challenge is to proceed with the AZURITE plan in an expeditious fashion while being careful to ensure that the implementation is not rushed to the point of cutting corners. While recognizing that the need for auxiliary systems is great, we must be careful to focus on building the foundation and establishing the framework of principal systems. Then, and only then, we can build upon this framework with a network of integrated auxiliary systems.



Financial Analysis

The WUDS draft report analyzes the financial implications associated with their recommendations. In summary, the report identifies that additional funding would be required for the following purposes:

- ▶ Six additional GPS units for ADWR;
- ▶ 10 to 15 FTEs for ADEQ data entry; and
- ▶ Additional FTEs for ADWR's basic data and records management.

Unfortunately, ADEQ's information problems won't be solved solely through the addition of 10 to 15 data entry clerks. ISDO recognizes the importance for converting certain hard copy documents into electronic data, however, overriding concerns at this point should be the development of the principal system infrastructure and improving the quality of data contained within existing systems for conversion into AZURITE auxiliary systems. Simply entering the data into the existing systems would limit the utility of the data. Once the principal systems are in place, the auxiliary systems can be designed, developed and populated with high quality data. At that point, it will be necessary to implement effective quality assurance/quality control programs along with effective training and documentation to ensure that the systems are used to their full benefit, and the data is maintained with a high degree of quality and confidence. Once the principal systems and applicable auxiliary systems are in place, converting old hard copy data into electronic format and expanding into areas such as electronic filing and electronic reporting become more feasible and the results potentially more effective.

The AZURITE approach of building an enterprise-wide system from the ground up requires cross program, agency level coordination. Funding for design and development of the system should also be cross programmatic and equitable.

Currently, ISDO and the AZURITE project are funded in this manner. Each division has contributed two FTEs to ISDO for a two year special assignment. The section manager, section secretary, contractors, capital equipment and travel are funded through the agency indirect fund. ADEQ's intention is to continue funding ISDO and AZURITE in this manner through January, 1998. This method of funding used by the ISDO AZURITE project is difficult and requires sacrifices. FTEs were drawn from already understaffed sections and dedicated to the project. The already high indirect rate was further burdened by the necessity to support other project needs. Senior management's decision to accept these sacrifices is an indication of their support of ISDO and AZURITE, and their dedication to solving our information management problems.

The course of action at the end of ISDO's two year assignment is currently undefined. A large part of this decision is dependent upon the interim success of the project. If the project is successful, options for continuation include extension of the special assignment and/or establishment of a permanent systems development group. The most desirable alternative would be to find additional sources of funding. This would allow the human resources that have been redirected from the programs for the two year term of the project, to be returned.

⁵ Refer to the ADEQ/ISDO "Design, Development and Implementation of AZURITE" report for a more detailed system description.



Analysis of Issues Outlined in the Well Use & Design Subcommittee Report

This analysis is based upon chapter 5 of the August 1996, draft of the "Well Design and Use Subcommittee Position Paper." This chapter identifies "Database Needs" associated

with existing systems at ADEQ and at ADWR as they apply to the Well Design and Use Subcommittee. The chapter also provides two recommendations to address these needs.

In general, the report identifies that information in existing databases at ADEQ and ADWR are not linked or integrated and contain redundant information of questionable quality. The process of extracting dependable, consolidated information from these systems is, at best, inefficient and sometimes impossible. There is currently no way to access the data contained in these systems from a single location. The report attributes these problems in part to insufficient communication between ADEQ and ADWR, to inconsistent database formats, insufficient staff for data entry, and a lack of data quality assurance.

The report recommends;

1. Enhancing interagency database coordination with a goal of integrated or linked systems.
2. That ADEQ & ADWR standardize on and convert applicable data to Oracle V7.x.
3. That new FTEs be established and dedicated to entering important data which currently exists on hard copy.
4. Improving public access by providing browsing, querying, electronic filing and electronic reporting via terminals in remote offices and through the Internet.
5. Improving data quality by fully integrating GPS and implementing a quality assurance policy and procedure to comprise a "State-wide Well Verification Program."

Not surprisingly, the report identifies problems consistent to those previously identified by ISDO.² ADEQ/ISDO is in full agreement with the issues identified by WUDS and believes that they are consistent with and verify the problems identified by ISDO. The report fails to recognize however, that similar problems exist outside the scope of the groundwater arena. In fact, similar problems exist across all media within each program of ADEQ. A clear indicator of this is evidenced by the ISDO "Inventory of Legacy Systems" which identifies that ADEQ has in excess of 250 non-integrated, non-connected information systems. The issues of data integration, data sharing, data quality and data access must be, and are being addressed as a department-wide issue. ISDO has developed a department-wide strategy and plan⁴ for addressing these issues on a holistic level.

The gist of the AZURITE strategy is to develop a "Software Nucleus," known as principal databases, which form the infrastructure for an enterprise-wide network of connected systems. These principal databases will hold the "key" data required to link or connect a series of auxiliary systems together. The auxiliary systems will be designed and developed to integrate into the principal databases. The auxiliary systems will be designed from a functional perspective" (e.g., Permitting, Compliance & Enforcement, Planning, etc.) and contain departmental data associated with each function.

Existing legacy systems will be examined on a case-by-case basis and modified or redesigned as necessary to integrate into the principal and auxiliary systems. New system development projects will be reviewed by ISDO for compatibility with AZURITE. An information technology steering committee (which was established in 1993) will review IS project proposals for approval/disapproval.

The resulting system will provide the structure necessary for extracting cross program information from a single interface and location. At the same time, the system will provide the flexibility to develop auxiliary systems which meet current or

² See the ADEQ/ISDO "Problem, Mission, Goals and Objectives."

³ The inventory is contained in the appendices of the ADEQ/ISDO "Design, Development, and Implementation of AZURITE" report.

⁴ See the ADEQ/ISDO "Design, Development, and Implementation of AZURITE."



ISDO/AZURITE Background

ADEQ's Information Systems Development Office (ISDO) was formed in January, 1996. The office is comprised of 14.5 full time employees. This staff has been placed on a two year special assignment for the purpose of initiating a major effort to overhaul information systems and information management within ADEQ. The full time staff is augmented by three full time contractors who fill specialized needs. ISDO has named this project "AZURITE."

ISDO's first objective was to identify and document the nature and cause of information system problems in ADEQ. The problem statement below was the result of this effort:

Existing agency information systems do not allow data to be shared, integrated, are not consistent with work flow nor commensurate with legal mandates. In the aggregate, the information system is inadequate, failing to use departmental resources in an efficient manner. Data frequently lacks quality assurance and quality control. Therefore, the ADEQ lacks the ability to provide sufficient quality information concerning environmental issues.

It is important to note that while the problem statement paints a grim picture, the existing systems do meet individual program needs and are a better alternative to the absence of systems. Several of the existing systems fulfill vital business needs and will require little work to integrate into AZURITE while others may need to be totally redesigned.

Once the problem had been defined, ISDO's focus turned to the development of mission, goals, objectives and performance measures in response to the problem. We defined our mission as:

The mission of the Information Systems Development Office is to examine existing information systems and data, and to recommend, design, develop and implement solutions that meet the department's internal and external customers' needs in a timely and cost effective manner.

We refined our mission into four goals as follows:

Provide a flexible, integrated framework of information systems (IS) that: allows exchange of information, conforms to agency work processes and mandates, and can be easily maintained into the future.

Improve quality of data within information systems to a high level of confidence and accuracy.

Improve system access to allow internal and external customers to retrieve needed information in a timely and cost effective manner.

Develop and implement high-quality documentation and training to maximize effective use of new systems and minimize new user learning curves.

Once the goals and objectives were established, ISDO compiled an inventory of existing information systems, conducted internal outreach/education and documented the high level needs of each organizational section. Utilizing all of this information, ISDO developed a strategy and work plan for the AZURITE project and sought approval of the proposal from senior management. The senior management team approved the recommendations shortly following a meeting on May 24, 1996.

Since receiving approval to proceed, ISDO has begun the design and development process for the first phase of AZURITE. Current projections have the principal AZURITE systems going into production in the first half of 1997. The AZURITE project concept is an all encompassing, enterprise-wide strategy. It is likely to take five years or more before that strategy can be fully implemented due to the magnitude and complexity of the project. In addition, once AZURITE is built, it will require continuous and on-going maintenance, support and enhancement. All too often in ADEQ's history, systems have been built and then left without ongoing maintenance and support. With the dynamic nature of our rules, regulations and business processes, these systems are quickly rendered insufficient. If ISDO is successful in this first phase, senior management must agree upon a more long term solution for continued development and support of AZURITE.

It is ISDO's position that if we are successful in fulfilling all of the objectives listed above, that we should pursue a three year special appropriation to carry the AZURITE project from July, 1998 through June, 2001. A budget packet for FY99 would be due for submittal in October of next year. Appropriation should be sought for full finding of the project which equates to approximately \$1.5 million per year. The line item detail of the current annual budget is as follows:

	Line Item	Amount
Personal Services	14.5 FTE	\$534,023
Employee Related Expenditures		\$123,353
Professional and Outside Services	3 Full time Consultants	\$308,630
Other Operating Expenditures		\$354,976
Travel In-State		\$6,144
Travel Out-State		\$15,022
Indirect		\$152,250
	Total	\$1,494,398

In addition to the three year operating budget, funding is required to upgrade desktop computers at the agency. ADEQ recognizes that desktop computers have a technological life of approximately three years. The Arizona Department of Administration (ADOA) depreciation schedules allow for replacement of computers once every five years corresponding to the physical life of the equipment. This gap between the technological and physical life-span must be overcome.

According to an inventory of ADEQ computers conducted in May, 1996, approximately 60% of the computers in ADEQ would require upgrade or replacement to meet the minimum technical standard for an ORACLE application such as AZURITE. This would account for an additional funding requirement of approximately \$750,000 in capital equipment.* This cost could potentially be spread over-time through a lease agreement, however, this would require further examination of the advantages and disadvantages of leasing.

Please note that the budget figures provided above are estimates based upon current information. If the concept of pursuing a legislative appropriation becomes a reality, ADEQ will provide a more detailed and budget justification.



Conclusion

While the cost of propelling ADEQ into the information age is high, the benefit of doing so is clear. In fact, the cost of not doing so, is likely higher in the long run. The demand for access to information is growing and will continue to grow. Governments that invest in technology and utilize it effectively will enhance and improve their business processes and benefit from improved customer service. Governments that do not invest in technology will fail to meet their customers expectations and needs and become stagnant, unproductive bureaucracies. It is important to look at the entire picture of information management as a whole, not as disjointed parts as has been done in the past. ADEQ, GITA and the AZURITE processes do just that.

It is worth noting that ISDO is actively bench-marking other states. Most states are encountering strikingly similar difficulties with Information Management. While several states have made progress in key areas, no state has put together a fully integrated information system. ISDO intends to learn from the successes and failures of these other states, and build a system which solves the dilemmas. Success in this endeavor will lead to national recognition and the potential for ADEQ's system to serve as a national model in addition to providing better service to our customers.

* Note: ADEQ is continuously working to upgrade the computer system hardware within the agency. The dollar amount shown in this report is based upon a May 96 inventory. The number of systems requiring upgrade today is likely lower. ADEQ has proposed 67 computer purchases in the FY98 budget and 73 for FY99. The dollar amount required in the appropriation would be the net difference between what is needed and what is already budgeted.

**FUNDING POLICY ISSUES
CONCERNING REFORM OF
THE WATER QUALITY ASSURANCE REVOLVING FUND**

prepared by

**THE WQARF FUNDING SUBCOMMITTEE
of the
GROUNDWATER TASK FORCE**

September 16, 1996

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SUMMARY OF SUBCOMMITTEE RECOMMENDATIONS

- All monies in the WQARF should be retained in the fund and should not revert to the general fund.
- WQARF function should be financed by continuous appropriations from WQARF, with the following exceptions: Identification and prioritization of new sites (including preliminary assessments, site investigation and site listing) and rulemaking, policy and guidance development, which should be financed by annual appropriations from WQARF. Initially there will be a need for significant rulemaking by ADEQ to implement the reformed WQARF program. Adequate funding should be provided for such rulemaking.
- The WQARF provision that exempts fund monies from lapsing should be retained.
- An advisory committee should be established to provide continuous oversight of the WQARF program and should submit an annual report to the President, Speaker and Governor. The Legislature should require that a Program Authorization Review be conducted every five years, beginning in the year 2002.
- Fairness dictates that the first sources of funds for WQARF remediation come from those who polluted, those who handle and dispose of toxic chemicals, those who choose to use the products manufactured from these chemicals, and those who receive relief from liability, if any, provided by WQARF reform. To the extent reasonable taxes on those sources do not create adequate funding, the general public, including parties that benefit from WQARF remediation, may need to supplement the program funding scheme. Considerations of fairness, however, cannot be the only factors in identifying appropriate funding sources. For example, taxes and fees that target specific groups might be "fair" but result in high costs of administration and collection or less stable revenues.
- Monies from all revenue sources should flow into one fund to be used for the entire WQARF program. Monies from a particular funding source should not be used only for remediation associated with that class of sources.
- The existing structure of WQARF fees and taxes should be retained, and recognition should be given to which taxpayers are already contributing to the WQARF as the funding mix for additional sources is developed.
- ADEQ should be directed to establish, by rule, criteria for when WQARF funds may be advanced prior to finalization of a Remedial Action Plan, and under what conditions the beneficiary should reimburse WQARF if the action is determined to have been unnecessary under the RAP. The criteria should address, at a minimum, the ability of the beneficiary to repay and the relationship of the proposed activity to the priority list.

WQARF POLICY ISSUES

This paper sets forth the major questions being asked about how the Water Quality Assurance Revolving Fund ("WQARF") should be funded and outlines arguments supporting various possible answers to the questions. The paper's purpose is to brief members of the Groundwater Task Force who may make funding recommendations to the Joint Select Committee on the Water Quality Assurance Revolving Fund. The paper is meant to be objective and balanced, presenting all points of view on the questions raised. The paper was prepared by the Funding Policy Workgroup of the Task Force's Funding Subcommittee. Any recommendations in this paper represent a consensus of the Funding Subcommittee.¹

I. FUND STRUCTURE AND ADMINISTRATION

A. **How can WQARF be structured to ensure that monies dedicated for WQARF are readily available and spent for WQARF purposes?**

Some options for answering this question are discussed in items 1 through 6 below.

1. **Non-reverting Monies:** The Legislature could provide that unused monies in WQARF do not revert to the state general fund for non-WQARF uses. (The WQARF statute currently provides that any monies remaining in WQARF on June 30 of each year exceeding twenty-five million dollars shall be deposited in the state general fund).

Should any monies unspent for the WQARF program annually revert to the general fund?

Yes:

¹ This paper assumes that the Groundwater Task Force supports a dedicated funding source for WQARF (i.e., monies designated for WQARF that cannot be spent for any other purpose) because: (1) All but one of the existing sources of WQARF monies are from dedicated funding sources (See A.R.S. §§ 49-282.A.2 through A.12); and (2) H.B. 2114 charges the Joint Select Committee with considering options "for an adequate dedicated source of funding" for WQARF.

- Such reversion provides statewide budgetary flexibility, making monies available to meet other societal needs (e.g., education, crime fighting);

No:

- Reversion may unintentionally encourage unwise agency expenditures at year end to avoid losing monies not spent;
- Monies should be left in the fund to accumulate from year to year in order to meet the fluctuating requirements of the program;
- Allowing monies to accumulate from year to year makes planning for multi-year remediation projects easier;
- If monies are not allowed to accumulate from year to year, more tax revenues may be necessary for remediations (i.e., the compounding effect of accumulating monies may ultimately reduce the need for additional tax revenues);
- Reversion is contrary to the concept of dedicated funding because it would allow dedicated monies to be spent for non-WQARF purposes.
- Taxpayers who are ^{their} paying taxes for WQARF remediations will want assurances that ~~there~~ taxes are being spent on such remediations rather than for non-WQARF purposes.

Recommendation: All monies in the WQARF should be retained in the fund and should not revert to the general fund.

2. **Continuously Appropriated Monies:** The Legislature could provide in statute that monies in the WQARF are continuously available to spend on WQARF functions, without ADEQ having to request appropriations annually. ADEQ still would have to report annually to the Joint Legislative Budget Committee about how such monies are spent (See H.B. 2114).

Should some functions of the WQARF program be subject to continuous rather than annual appropriations?

Dedicated monies may be annually or continuously appropriated. The primary difference is the point in time where legislative approval and agency accountability occur.

Continuously appropriated monies are available for agency expenditure upon their deposit in the fund. Legislative oversight occurs when ADEQ files annual reports explaining how the monies have been spent. Continuous appropriations:

- May facilitate smoother functioning of the WQARF program and expedite remediations because the monies are available upon receipt without delay or interruption;
- Would be better than annual appropriations for remediation projects that cover more than one fiscal year; *and*
- Eliminate administrative steps associated with the annual appropriations process, thus reducing costs of the program; *and*

Annually appropriated monies must be requested by ADEQ and authorized by the Legislature each year for the coming fiscal year beginning July 1. Annual appropriations:

- Provide the Legislature with prospective rather than retroactive control over ADEQ expenditures for WQARF (e.g., more control to prevent the shifting of WQARF dollars to non-WQARF functions; *and*
- Can be added to by supplemental appropriations from the fund at any time throughout the year, if the situation requires.

Recommendation: The workgroup's recommendation regarding continuous and annual appropriations of monies in the WQARF is contained in the table below. (This recommendation is based on the assumptions that funding is dedicated and unspent monies do not revert to the general fund.)

WQARF Function	Continuously Appropriated	Annually Appropriated
Identify and Prioritize New Sites (preliminary assessment/site investigation; site listing)		✓
Remedy Selection (RI/FS)	✓	
Risk and Health Assessments	✓	
Emergency Response	✓	
Remediation and Implementation	✓	
Enforcement (search for PRPs, recalcitrant roundup), Allocation Process	✓	
Rulemaking, Policy and Guidance Development		✓
Personnel Management and Overhead for WQARF Program Functions only	✓	

Rationale for recommending annual appropriations:

New Sites: The annual appropriations process will give more control to the Legislature to evaluate and decide how much money should be expended each year on identifying and prioritizing new sites as opposed to focusing on the remediation of existing sites. (The Groundwater Task Force reached a consensus at its August 8, 1996 meeting that the goal of the WQARF program should be to spend not more than 20% of the fund on identification and prioritization of new sites).

Rulemaking: It is not necessary to have a continuous source of funds available for WQARF rulemaking because such rulemaking will not be perennial but only occasional, as necessary. The Subcommittee believes that initially there will be a need for significant rulemaking by ADEQ to implement the reformed WQARF program and that adequate funding should be provided for such rulemaking.

Rationale for recommending continuous appropriations:

All of the noted functions are directly related to the remediation of priority sites. Continuous appropriations will ensure that remediation occurs as expeditiously as possible without interruption.

Note: The above recommendation was not unanimous. A segment of the Funding Policy Work Group believes that all functions of the new WQARF program must be funded by continuous appropriations in order to ensure that the program operates effectively and efficiently. With annual appropriations, long term planning and multi-year projects may suffer unnecessary delays and inefficiencies.

3. **Non-lapsing Monies:** A.R.S. § 35-190 provides that authorization lapses at the end of the fiscal year to spend or incur any obligation for expenditure of monies that have been appropriated for that year. (The WQARF statute currently exempts fund monies from lapsing under A.R.S. § 35-190).

Recommendation: The current provision of WQARF that exempts fund monies from lapsing should be retained.

4. **Ballot Proposition - Statutory Measure:** WQARF funding provisions could be placed on the general election ballot either by initiative or referendum. If such a proposition is adopted by the vote of the people the Legislature is less likely to make changes to it. A statute created by ballot may be modified by the Legislature. (The Arizona Game and Fish Heritage Fund was established in statute by initiative measure).

Should WQARF dedicated funding be established by a vote of the people?

Yes:

- A ballot initiative could reduce the Legislature's participation in appropriating or allocating funds. The Legislature would find it more politically difficult to change how fund monies are appropriated and expended.
- This approach will demonstrate whether the voters of the state support the concept of a dedicated WQARF.

No:

- It will take time and money to succeed at a ballot initiative. Such effort could delay remediation. This strategy is very risky, given that very few propositions are passed by the electorate.
- The statutory provisions that govern management of the fund can be changed by legislative enactment.
- The fund may be considered more politically difficult to modify in any way in the future (e.g., those favoring a sunset of the fund at some future time may not favor this approach).
- Appropriation by ballot circumvents the responsibility of the Legislature to make public policy decisions about funding of state programs.

Recommendation: None at this time.

5. **Ballot Proposition – Constitutional Amendment:** The Arizona Constitution could be amended to restrict the use of fees or taxes generated from a dedicated funding source or sources for WQARF purposes only (e.g., the Constitution limits the use of vehicle and fuel taxes to highway and street purposes, See Const. Art. 9, § 14). Whether placed on the ballot by referendum or initiative, such an amendment could only be enacted or changed by a vote of the people.

Recommendation: None at this time.

6. **Periodic Program Review:** The consensus of the Funding Subcommittee is that there should be periodic review of the WQARF program. Regarding what type of review should occur and how frequently, some options are as follows:

Advisory Committee: A committee could be established by legislation for the express purpose of overseeing ADEQ's expenditure of WQARF monies. Committee members could be from the Legislature and the public, appointed by the President of the Senate, the Speaker of the House and the Governor. The committee shall report to the President, Speaker and Governor regarding the program. Also, any reports filed by ADEQ also should be sent to the Advisory Committee.

Regular Reports To Legislature: Whether the monies in WQARF are appropriated on an annual or a continuous basis, ADEQ has to submit reports to the Legislature on how monies are being expended.

Auditor General: Legislation could require that a performance audit of the WQARF program be conducted by the Auditor General. The legislation should specify how frequently such an audit should be conducted and appropriate monies to cover the costs of the audit.

Program Authorization Review: This review is conducted by the Governor's Office of Strategic Planning and Budgeting ("OSPB") and the Joint Legislative Budget Committee ("JLBC"). Its analysis focuses on a program's results, strategic plan, and performance measures that are required to be developed by the Arizona Budget Reform Act of 1993. The review involves an agency self-assessment, a JLBC/OSPB program review and report, and a recommendation to retain, eliminate or modify the program. Legislation establishes which agency programs will be reviewed and when.

Recommendation: An advisory committee should be established to provide continuous oversight of the WQARF program and should submit an annual report to the President, Speaker and Governor. The Legislature should require that a Program Authorization Review be conducted every five years, beginning in the year 2002. The review should include, at a minimum, an evaluation of how monies are being spent, how remediations are progressing, current and future funding needs, and when is the appropriate time to terminate the program. Given that the WQARF program is designed to clean up historical contamination and that present and future polluting activities are being regulated by existing permit/regulatory programs, there should come a point when the historical contamination is remediated and the need for continuing the program as presently structured should be evaluated.

II. SOURCES OF FUNDING

The questions that follow concern who should contribute to the financing of the WQARF program.

A. Who should fund the WQARF program?

"Fairness" was the buzzword during the 1996 legislative session among those in the business community striving to reform WQARF through the elimination of joint liability. At

that time, responsible parties asked to pay only their equitable share of the cost of remediation. As the Funding Policy Workgroup has wrestled with the issue of "fairness" related to paying for the WQARF program, it has become increasingly clear that complete fairness is unreachable. The parties responsible for the discharge (responsible parties) are not always still in business, or financially viable. The costs associated with such parties become "orphan shares" which must be picked up by others. Additionally, some program costs cannot be associated with particular sites or responsible parties. In any event, specific responsible parties, regardless of the source of funding for WQARF, will still be responsible for paying a portion or all of the costs of remediating their contamination.

Questions are asked, such as: "Should the polluter pay"? "Should the beneficiaries of WQARF remediations pay"? "Should the public at large pay"? "If there is some relief from liability, should those who benefit from such relief pay"?

Discussion:

Polluter Pays: "Polluter pays," in the strict sense of the term, means that those who released the contaminants, or the responsible parties, pay for the entire cleanup (including the orphan share) regardless of their comparative contribution to the contamination. "Joint liability" is such a system. "Polluter pays" has been called unfair because it means that some polluters must pick up the cost for all polluters. Others say it is "more fair" than making the "innocent taxpayer" pay. A tax on entities that produce or use toxic chemicals may result in double taxation, if those entities are responsible parties paying for cleanup of specific sites.

Business Community Pays: Some people seem to equate "polluter" with the business community. Should the business community pay? A tax that applies to the business community may be affecting many businesses that never use the compounds found in groundwater contamination. Taxes that target businesses that manufacture or use toxic compounds might be "more fair."

Entities Making or Using Toxic Compounds Pay: Should industries and other entities that produce or use toxic compounds pay? If so, that means some entities which have safely handled toxic compounds and never caused groundwater contamination must pay. However, a tax on those who handle, use or dispose of toxic chemicals may be considered as a cost of doing business in our society. Note: An ancillary benefit of this funding source may be increased emphasis on pollution prevention. However, as the reliance on toxic compounds is reduced through substitution and ingenuity, revenues from this source could be expected to decline over time.

Consumers Pay: Should consumers (e.g., individuals, businesses, government) who use products made from toxic compounds pay? Most consumers benefit from the use of toxic compounds because they use the products manufactured from them. Consumers also contribute to the disposal problems in and out of landfills. It has been pointed out that

some manufacturers already pass such costs through to the consumer such that an additional consumer tax would be "double taxation." A tax on the products themselves (e.g. a Drano tax) allows consumers to choose to purchase alternative products. A general tax on all consumers (e.g. a sales tax) would "unfairly" tax those consumers who avoid such products.

Beneficiaries of WQARF Reform Pay: Beneficiaries of WQARF reform include:

- Those who drink water, who use clean water for recreation, or who use water as a factor of production. This is basically everyone. Clean water benefits all water users in the states. Under Arizona law, water in the state belongs to the citizens of the state who have needs and rights to withdraw the water for use. Contaminated water may require expensive cleanup to safe levels before it can be used.
- Those who benefit from higher land values where soil remediation has occurred. Remediation may allow for economic uses of the land which would otherwise be impossible. The affected members of the real estate community, lenders, developers and property owners are some who fall within this category.
- Those who benefit from reduced transactional costs (including legal fees) associated with WQARF reform, including responsible parties, insurers and the public.
- Those who benefit from any relief from liability which may be provided by this WQARF reform effort.

In the past, the WQARF law imposed a large portion of cleanup costs on the responsible parties to whom the contamination can be attributed. This is consistent with our general principles of justice under which parties who damage property of another are responsible for restoration or payment of damages. However, additional funding for cleanup is needed in cases where responsible parties are not available to pay their shares. As discussed above, it is "more fair" for funding for the WQARF program to be sought first from sources with some nexus to the contamination. However, to the extent that this funding is still insufficient, obtaining additional funding from the general public may be appropriate. It is unlikely that the public will support a tax unless it perceives that WQARF funding is fair.

Recommendation: Everyone needs clean, usable water and land. Fairness dictates that the first sources of funds for WQARF remediation come from those who polluted, those who handle and dispose of toxic chemicals, those who choose to use the products manufactured from these chemicals, and those who receive relief from liability, if any, provided by WQARF reform. To the extent reasonable taxes, fees, and other

contributions from those sources do not create adequate funding, the general public, including parties that benefit from WQARF remediation may need to supplement the program funding scheme.

Finally, considerations of fairness cannot be the only factors in identification of appropriate funding sources. For example, taxes and fees that target specific groups might be "fair" but result in high costs of administration and collection or less stable revenues.

B. Should monies from a particular funding source be used only for remediation associated with that class of sources? (e.g., dry cleaners contributing to a dry cleaner remediation fund; land fill tipping fees directed solely to land fill remediations)

Yes:

- This approach is consistent with the notion that each industry should "take care of its own."
- This approach may result in industry self-policing to see that any future liability is not incurred.

No:

- Accounting complexity and costs of program administration are likely to increase.
- This approach interferes with site prioritization.
- This approach limits the ability to coordinate multiple source remediation at a site.
- Revenues from an individual funding source may not be sufficient to pay the total costs of remediation associated with that funding source.
- It is difficult to design an effective tax that is directly proportionate to the liability generated by those classes of funding sources.

Recommendation: Monies from all revenue sources should flow into one fund to be used for the entire WQARF program. Monies from a particular funding source should not be used only for remediation associated with that class of sources.

C. Should the existing fees and taxes financing WQARF be retained? (See A.R.S. § 49-282.A)

Yes:

- It is premature to call for the elimination of the established base of funding when existing monies are inadequate to fund the program.
- Given the difficulty of creating new taxes and raising existing ones, it would be politically wise to keep the existing funding sources in place.
- If existing sources are terminated, more money will be required from new sources.

No:

- Some of the existing monies are inefficient to collect.
- Existing sources of funding may not be equitable.

Recommendation: The existing structure of WQARF fees and taxes should be retained, and recognition should be given to which taxpayers are already contributing to the WQARF as the funding mix for additional sources is developed.

[135358.1]

MEMORANDUM

To: Groundwater Task Force

From: Funding Workgroup

Date: August 26, 1996

Re: Contaminants At WQARF Sites

The Funding Workgroup presents the attached chart, produced by Workgroup member Jean Calhoun, to the Groundwater Task Force. The chart demonstrates the incidence of various contaminants at listed WQARF sites, details the processes which result in these contaminants being discharged to the groundwater, and lists products manufactured through those processes. This chart should give the Task Force a clearer picture of the industry sectors that utilize those chemical compounds contributing to our groundwater contamination, as well as the products associated with these chemicals, from which society benefits.

The columns on the following page contain:

1. Compounds found at WQARF sites
2. Products/Processes using these compounds
3. Types of business activity or industry using these compounds
4. List of sites where compound is found
5. The number of listed WQARF sites in which that particular compound appears
6. This column may be the most confusing; Identifies which types of compounds are involved in what percentage of WQARF sites (this information is drawn from ADEQ material)
7. Ranks sites where compound is located according to estimated cost of site remediation (e.g. where (1) is the most expensive site to remediate, (2) is the second most expensive site to remediate, etc.)

This data has been developed from ADEQ's draft document describing WQARF priority list sites, and other source material describing the uses of certain compounds.

Table 1

Contaminants at WQARF Sites and Potential Sources

Compound	Products/Processes	Types of Sites	Priority WQARF Sites	# Priority WQARF Sites	% WQARF Sites	Sites Ranked by Cleanup Estimate ¹
PCE	Dry cleaning; metal degreasing; solvents for fats, greases, waxes, rubber, gums, caffeine(food ind.); remove soot from industrial boilers; Mfg paint removers, printing inks; mfg. trichloroacetic acid; vermifuge; heat transfer medium; mfg fluorocarbons	Manufacturing, dry cleaning, food industry; landfills	Broadway-Pantano; East Central Phoenix; Los Reales Landfill; Miracle Mile; Nogales Wash; Payson; Raymond Street; Silverbell Landfill; Sky Harbor; South Mesa; West Central Phoenix; West Van Buren	12		1, 3, 4, 5, 8, 10, 11, 13, 15, 18, 21
	Dry cleaning; metal degreasing; solvent for fats, greases, waxes; solvents for greases & waxes from wool, cotton; caffeine from coffee; solvent for cellulose ester & ethers; dyeing; refrigerant; heat exchange; organic synthesis; fumigant; anesthetic	manufacturing, dry cleaning, metals plating, food industry, textile industry	Broadway-Pantano; East-Central Phoenix; Los Reales Landfill; Miracle Mile; Northeast Mesa; Silverbell Landfill; Sky Harbor; South Mesa; Tucson Airport; West Central Phoenix; West Van Buren	11		1, 3, 4, 5, 7, 8, 11, 14, 18, 21
1,1,1-TCA	cleaning & degreasing solvent; fumigant for citrus	Manufacturing; landfills; agriculture	East-Central Phoenix; Sky Harbor	2		18

Contaminants at WQARF Sites and Potential Sources

Compound	Products/Processes	Types of Sites	Priority WQARF Sites	# Priority WQARF Sites	% WQARF Sites	Sites Ranked by Cleanup Estimate ¹
1,1-DCE	Adhesives; plastic wrap; pipe coatings; plastic mfg; carpet backing; component for synthetic fibers	Manufacturing; textile industry; landfills	Los Reales Landfill; Miracle Mile; Northeast Mesa; Northwest Tempe; South Mesa; West Central Phoenix; West Van Buren	7		1, 3, 4, 7, 11, 12, 21
methylene chloride	Paint stripper; laboratory solvent; degreasing agent; furniture & plastics processing; process solvent for chemical & pharmaceutical products	manufacturing; landfills	Los Reales Landfill	1		4
Vinyl chloride	Parent compound of PVC; vinyl floor tiles; anaerobic decomposition byproduct	manufacturing; landfills	Estes Landfill; Miracle Mile	2		9, 11
Freons	Laboratory solvent; refrigeration	air conditioning; laboratories; manufacturing; landfills	Los Reales Landfill	1		4

Table 1
Contaminants at WQARF Sites and Potential Sources

Compound	Products/Processes	Types of Sites	Priority WQARF Sites	# Priority WQARF Sites	% WQARF Sites	Sites Ranked by Cleanup Estimate¹
chlorobenzene	Solvent recovery plants; intermediate in dyestuffs mfg; mfg. aniline, insecticide, phenol, chloronitrobenzene	Manufacturing; pest control; agriculture; landfills	Estes Landfill	1		9
1,2-dichlorobenzene	Solvent; dye mfg.; fumigant & insecticide; metal polishes; industrial odor control; mfg of organic compounds	Manufacturing; agriculture; pest control; textile industry; landfills	Estes Landfill	1		9
VOCs (general)		Manufacturing; dry cleaning; metals plating; landfills	East Washington; El Camino del Cerro Area; Los Reales Landfil, Miracle Mile Interchange; Nogales Wash; Northwest Tempe; Tucson Airport	7	46+25x(mixed)	2, 4, 10, 11, 12, 14, 17
Lead	Pigments for paints; ballast; solder; automobile parts	mining, metals plating, manufacturing; landfills	Aluminum Dross; Schultz Fluuff Dump	2		16, 22
Cadmium	Pigments for paint; automobile parts	mining, metals plating, manufacturing; landfills	Aluminum Dross; Schultz Fluuff Dump	2		16, 22

Table 1

Contaminants at WQARF Sites and Potential Sources

Compound	Products/Processes	Types of Sites	Priority WQARF Sites	# Priority WQARF Sites	% WQARF Sites	Sites Ranked by Cleanup Estimate ¹
Chromium	chrome-plating; automobile accessories	mining, metals plating, manufacturing; landfills	Hexel Chromium Disposal; Tucson Airport	2		14, 20
Metals (general)		mining, metals plating, manufacturing	El Camino del Cerro; Gila River Lower/Middle; Pinal Creek	3	17+ 25x(mixed)	2, 6, 16
PCBs	Transformer oil; hydraulic oil; brake fluid; high temp. applications to stabilize oil	building, manufacturing; landfills	Gila River Lower/Middle; Schultz Fluff Dump	2		22
organochlorine pesticides (eg., toxaphene, DDT)	pesticides, insecticides	agriculture; pest control	Gila River Lower/Middle; Safford Airport	2	13	23
DBCP	fumigant	agriculture	Mesa DBCP	1		19
Benzene	fuels, petroleum hydrocarbon	fuels, petroleum hydrocarbon	Miracle Mile, Nogales, Broadway, Payson, East Washington	5		5, 10, 11, 13, 17
Toluene	fuels, petroleum hydrocarbon	fuels, petroleum hydrocarbon	Northwest Tempe, East Washington, Mohave County/Kingman	3		12, 17
Ethylbenzene	fuels, petroleum hydrocarbon	fuels, petroleum hydrocarbon	Los Reales, El Camino, West Van Buren	3		1, 2, 4

Table 1
Contaminants at WQARF Sites and Potential Sources

Compound	Products/Processes	Types of Sites	Priority WQARF Sites	# Priority WQARF Sites	% WQARF Sites	Sites Ranked by Cleanup Estimate ¹
Xylenes	fuels, petroleum hydrocarbon	fuels, petroleum hydrocarbon	Northwest Tempe, Estes Landfill, West Van Buren	3		1, 9, 12
¹ 1 = most expensive cleanup estimate						

MEMORANDUM

To: Karen Peters
From: Funding Workgroup
Date: November 14, 1996
Re: Funding Proposal Charts

Attached for your information and review are the six tables representing the work of the Funding Workgroup.

1. Current WQARF Funding Sources
2. Proposed Increase to Existing Fees
3. New Fees and Taxes
4. New Fees and Taxes That Generate Less than \$500,000 in Revenue
5. New Financing Alternatives/Bonding
6. Fees and Taxes/Revenue Generation Unknown

The tables were prepared based on the following principles:

1. Every proposal received by the Funding Workgroup is included in the tables. Some proposals were modified slightly to more closely match existing models for fee assessment and taxation. No proposals have been eliminated at this point. If anyone believes a proposal has been left off the chart, please fax the details of the proposal to Sandy Price, Workgroup Chair.
2. Every proposal has been evaluated with respect to the following factors:
 - a. Fund Source provides a brief description of the tax or fee.
 - b. Who Pays identifies the class of persons who actually pay the tax out of their pockets or, in some instances, the person who collects the tax but who may pass it on to customers.
 - c. Rate in most cases is somewhat arbitrary, selected by the group for purposes of illustration and to calculate the projected amount of revenue generation. In a few cases, the rate was selected by the original proponent. If more or less revenue is desired, the rate is obviously subject to adjustment.
 - d. Revenue Generated is the projected amount of revenue that would be generated if the tax or fee is assessed at the indicated rate. Readers should note that the tax or fee is based upon the best available information and not exhaustive research.
 - e. Efficiency/Stability is an evaluation of two factors identified by the Workgroup as relevant to the desirability of various funding sources.

Efficiency generally reflects the relationship between the administrative costs of collecting the fee or tax and the amount of revenue generated. Stability refers, in some instances, to historical fluctuations or trends in the revenue base due to economic or other factors. In other instances, this factor considers elasticity or the anticipated impacts of the fee or tax itself on purchasing or other decisions that may lead to a declining revenue base.

- f. Comments/Concerns contains additional comments or concerns identified by the "Ideas" Sub Sub committee.
3. The Funding Workgroup did not complete the format sheet for those ideas projected to generate less than \$500,000 in revenues annually, or where there is insufficient information to project revenue. This cutoff was used simply as a means of focusing the group's resources on larger sources of revenue; no decision was made to eliminate any funding sources from further consideration. There may be a desire to use a combination of funding sources that include some of the smaller revenue generators. If so, the Funding Workgroup would be happy to expand its evaluation to include some of the smaller revenue sources.
 4. Nothing in the tables should be considered as a recommendation regarding whether any or all of the proposed funding sources are viable and appropriate or not. The purpose of the tables is simply to present the best information available for evaluation of the funding sources. The Funding Workgroup hopes the tables will provoke further discussions that will narrow the field of potential funding sources for more detailed evaluation.

WQARF FUNDING SUBCOMMITTEE: FOOD FOR THOUGHT

This list of questions is being supplied by the Funding Workgroup to prompt thinking and comment about the WQARF funding ideas submitted to the Groundwater Task Force. The Funding Workgroup requests that all interested parties submit comments on the funding ideas by August 19th. Comments may be submitted to Sandy Price, Workgroup Chair, 279-2027 (fax) or c/o Sacks Tierney P.A., 2929 N. Central Avenue, 14th floor, Phoenix, Arizona 85012.

- I. Overall, is the proposed fund source a fair tax or fee? Why or why not?
- II. Is there a relationship between the fund source and the cause of the pollution; if so, what is the relationship?
- III. Is there a relationship between the fund source and the benefit of clean water and soil; if so, what is the relationship?
- IV. Does the fund source create an impact on business competitiveness, and if so, please describe the impact?
- V. Do you have comments on the way the tax was structured (e.g. whether the fee is per unit or percentage; whether the rate seems reasonable)?
- VI. Other comments?

**WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES**

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Fertilizer License Fee (ARS 3-272)	Any manufacturer or distributor of commercial fertilizer Registration of any specialized fertilizer	\$100 for each license. \$50 per brand and grade of specialty	\$24,922	Efficiency: Tax currently administered by AZ Dept. Of Ag. Stability: Fee is stable but could decrease as companies eliminate pesticide labels	
Hazardous Product License/Drainage Tax		Unknown/disco ntinued tax	\$18,900	Efficiency: Stability: Discontinued.	
Ray Road	Reimbursement for voluntary cleanup	Negotiated	\$9,300	Efficiency: Stability:	ADEQ has to expend funds to recover these funds.
Manifest Resubmittal (ARS 49-922.01)	Anyone who improperly submits a manifest for shipment of hazardous waste.	\$20 per incorrect submittal	\$6,200	Efficiency: Procedures exist to collect the fees. Stability: Since FY 93, generates between \$4,000 and \$7,000 annually.	
Unrestricted Contributions	Individuals who make donations to the WQARF fund	Varies depending on individual	\$25	Efficiency: Easily collected and welcomed. Stability: Unstable and improbable	
Publications			***		

**WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES**

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Solid Waste Landfill Registration (ARS 49-747)	All solid waste landfills	Sliding scale depending on number of people served. Rates range from \$500 - \$5,000 annually.	\$91,250	Efficiency: Landfills pay at the time of registration. System presently exists. Stability: After FY 1996, money will no longer go to WQARF	
Industrial Discharge Permitting Fee (ARS 49-209)	Any person required to obtain a permit for discharges into a community sewer system	\$250 annually	\$80,450	Efficiency: Procedures currently in existence. Stability: Since FY 92, generates between \$37,000 and \$80,000 annually.	
Cost Recovery Emergency Response (ARS 49-282.02)	Parties responsible for cleanup/emergency response.	Negotiated.	\$74,036	Efficiency: Stability:	ADEQ has to expend funds to recover these funds.
Interest From Tucson AA Loan (ARS 49-282)	Interest generated from loan	Unknown	\$35,695	Efficiency: Stability:	
Int. Water Comb. Reimb.	One time reimbursement	Unknown	\$26,000	Efficiency: Stability:	

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Department of Defense (DOD) Cost Recovery	Department of Defense		\$269,984	Efficiency: Stability:	ADEQ has to expend funds to recover these funds.
APP Application Fees (ARS 49-210)	Any facility filing for an APP permit	Fee for service. Facility is charged only for time spent on processing application.	\$215,750	Efficiency: Requires administrative burden on facility and agency. Stability: After FY 96, money will no longer go to WQARF.	Does not generate significant excess funds, because of fee for service concept. Fees pay for personnel to review and issue permits.
Interest (ARS 49-282)		Varies	\$190,775	Efficiency: Stability:	
Groundwater Withdrawal \ Quality Assurance Fee (ARS 45-616)	Collected from each person who owns a type 1 or a type 2 non-irrigation grandfathered right or who holds a groundwater withdrawal permit for beneficial use.	\$2.12 per acre-foot	\$129,779	Efficiency. Presently collected. Stability. From FY 92 through projected FY 98 generates \$129,000 - \$260,000. Yield increasing	Does not apply to water that is subject to the tax on potable water (ARS 42-1552)
Quality Printed Circuits	QPC, one time settlement	Negotiated.	\$96,033	Efficiency: Stability:	ADEQ has to expend funds to recover these funds.

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Haz. Waste Facility Fee (ARS 49-929/ARS 49-930)	All hazardous waste treatment , storage, and disposal facilities, hazardous waste transporters and hazardous waste generators	Haz treatment, storage and disposal facilities - \$1,500 plus \$2 per ton of haz waste received. Transporters - \$200 Large quantity generators - \$300 Small quantity generators - \$100 All fees paid annually.	\$305,098	Efficiency: Collection procedures exist. Stability: Since FY 92, generates between \$195,000 and \$305,000 annually. Yield likely to decrease over time due to switching to other chemicals or reporting evasion	
APP Permit Annual Registration Fees (ARS 49-210)	Any facility possessing an APP permit	Dependent on amount of discharge.	\$300,284	Efficiency: Facilities are billed individually Administrative burden on facility and agency. Stability: Relatively stable over time.	Billing is automated. Administrative burden to ADEQ is mostly in collection of unpaid bills.

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Federal Grant for Preliminary Assessment (PA) and/or Site Inspection (SI), Extended Site Inspection (ESI)	EPA grant	Annual appropriation	\$650,000 FY 96	<p>Efficiency: Administrative burden on ADEQ to comply with terms of grant</p> <p>Stability: Uncertain continued funding levels based on funds available and political priorities.</p>	"EPA is reducing these dollars by 75% over time, and funds will not be available in the future."
Pesticide Registration Fee (ARS 3-351)	Every pesticide which is distributed, sold or offered for sale within the state, delivered or transported intrastate	\$75 for each pesticide	\$470,331	<p>Efficiency: This tax is already administered by AZ Dept. Of Ag., would not increase administrative burden</p> <p>Stability: Fee is stable, but could decrease as companies eliminate pesticide labels</p>	
Bank One	One time settlement	--	\$399,000*	--	ADEQ has to expend funds to recover these funds.

**WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
CURRENT WQARF FUNDING SOURCES**

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS / CONCERNS
Water User Fee (ARS 42-1552)	Any operator of a municipal water delivery system	\$0.0065 per 1,000 gallons.	\$1,653,929	Efficiency: Already assessed and collected by DOR Stability: Increasing slightly over period	
General Fund Appropriation	All taxpayers	Based on annual availability of funds	\$1,550,000	Efficiency: Stability:	
Cost Recovery (ARS 49-282)	Any penalty assessed due to violation of any statute.	Varies depending on severity of violation.	\$1,008,578	Efficiency: Stability: No FY 96 projection. Incoming funds have increased each year.	ADEQ has to expend funds to recover these funds.
Restitution (49-282)	Responsible party	Varies depending on severity of violation. Negotiated.	\$687,622	Efficiency: Stability: None	ADEQ has to expend funds to recover these funds.

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Sales tax increase (title 42)	Any buyer of goods in Arizona.	Additional 0.1 %	\$50,800,000	Efficiency: Collection system already in place. Stability: Reliable source of income, subject major economic fluctuations.	Alternative could be to increase specific catagories. Vertical equity issue on all sales taxes. Concern about exemptions. Part of this fee is exported. Would this require vote of people? Prop 108 issue.
Gasoline/diesel fuel increase (28-1501 and 28-1552)	Any buyer of gasoline/diesel fuel in state.	\$.01 per gal;	\$23,000,000	Efficient: Collected by retail outlet, or wholesale distributor. Stability: Consistently increasing, with little price resistance by consumer.	One cent gallon excise tax currently assessed for Underground Storage Tank (UST) program. This would be in addition to this fee. May require a constitutional change (?) Stronger nexus between this tax and groundwater pollution than sales tax. Part of this fee is exported
Corporate income tax increase	All corporations filing in the state of AZ	10 % increase in corporate income tax	\$20,000,000 (estimate)	Efficiency: Already collected Stability: Depends on business and economic cycle	Based on 1992 figure. AZ rate is higher than surrounding states

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Severance tax increase on metalliferrous minerals mining companies	Mining companies	Add 0.5 % of nonshared base (double state share of tax)	\$7,500,000	<p>Efficiency: Already administered by state.</p> <p>Stability: Could vary from year to year based on commodity prices and general economic conditions</p>	<p>Changes to federal mine law could increase costs to producers for abandoned mine lands.</p> <p>"Production will fluctuate long term, production will decline as ore reserves are depleted. May raise questions about stability of long term funding."</p> <p>"This is one of three potential new funding sources that will impact exclusively (or primarily) the mining industry (along with the severance tax on metalliferrous minerals and the EPCRA 313 tax)."</p> <p>"Only one mining site is on WQARF priority list or the NPL. It may not be fair for an industry tied to 3 % of existing priority sites (1 of 28) to contribute roughly 50 % of new WQARF funding, (assuming a \$7.5 million annual figure)."</p> <p>"The objective should be to share cost among industries, rather than singling out one industry."</p> <p>"The vast majority of this tax will be borne by the State's four copper producing companies."</p>
Hotel and Motel bed tax increase	All travellers who stay in any AZ hotel/motel	Increase from 5.5 % to 6.0 % (Last year \$76.6 million collected on a 5.5 % sales tax)	\$6,960,000	<p>Efficiency: Already collected. No increase in administrative burden.</p> <p>Stability: Fast growing and stable revenue source, but subject to business and economic cycles.</p>	<p>Opportunity to export this tax to people visiting from out of state.</p> <p>Collected by all hotel/motel owners in the state of Arizona.</p>

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Severance tax increase on nonfuel minerals	Mining companies	0.01 % of gross production values	\$4,176,870	Efficiency. Collection system already in place Stability. Could vary from year to year based on commodity prices and general economic conditions	No ability to pass on tax to consumer. Assessed against potential pollution sources. What portion of mining contribution goes to clean up mining sites? "Production will fluctuate long term, production will decline as ore reserves are depleted. May raise questions about stability of long term funding." "This is one of three potential new funding sources that will impact exclusively (or primarily) the mining industry (along with the severance tax on metalliferous minerals and the EPCRA 313 tax)." "The objective should be to share cost among industries, rather than singling out one industry." "Only one mining site is on the WQARF priority list or the NPL. It may not be fair for an industry tied to 3 % of existing priority sites (1 of 28) to contribute roughly 25 % of new WQARF funding (assuming a \$15 million annual figure)." "The vast majority of this tax will be borne by the State's four copper producing companies."
Municipal water users tax increase (45-611)/(42-1552)	Water providers including cities, towns, private water companies and permittees.	Increase rate to \$0.01 per 1,000 gallons. Current water use tax assessed at \$0.0065 per 1,000 gallons and raises approx. \$1.67 million.	\$2,800,000 (estimate)	Efficiency: Already assessed and collected by DOR. Stability: Increasing slightly over period.	May only cost approx. \$5 per family, need a more accurate assessment of impact. Clear connection between water quality and fee payers. Fees fall equally on all providers and permittees based on water usage.

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Solid waste fee increase of already existing WQARF funding (49-836)	Anyone disposing of solid waste at a solid waste landfill. Pick up trucks are exempt.	\$.25 per ton currently generates \$1,200,000. Increase rate to \$.50 per ton.	\$2,400,000	Efficient: Yes, collected by owner/operators of solid waste sites. Stability: Fees increase slightly each year.	APS proposed an increase in solid waste tipping fees, with the revenue to be used to fund cleanup of publicly owned municipal landfills. Concern of reaching point in fees where private citizens may refuse higher fees and dump in unregistered or desert sites. Maintaining pick up truck exclusion may avoid this problem. Revenue based on usage of space of solid waste landfill.
Used tire disposal fee/increase (4-1301)	Fees on new tires purchased in AZ (current rate: 2% not to exceed \$2 per tire)	4 % not to exceed \$4	\$2,000,000	Efficiency: Administered by DOR? Stability: Yield likely to increase as # of autos increase	Fee currently goes to counties on a per capita basis. Additional fee would go directly to ADEQ/WQARF
Pesticide fee tied to label (increase in existing WQARF) (3-272 and 3-351)	7,500 pesticide labels \$75 annual registration fee collected by AZ Dept. Of Ag. Currently generates \$475,000.	\$200 annual registration fee. Increase from \$75.	\$1,500,000	Efficiency: This tax is already administered by AZ Dept. Of Ag., would not increase administrative burden. Stability: Fee is stable, but could decrease as companies eliminate pesticide labels.	Question on how frequently this tax is collected and impact on revenue stream.
Surcharge/increase on hunting and fishing licenses (17-333)	Individuals who receive hunting and fishing licenses.	Add 10% surcharge on licenses, tags, permits, stamps etc.	\$1,500,000	Efficiency: Fees already collected, little increase in administrative burden. Stability: Decreasing revenue over time.	Possible statutory problems with diversion of funds? Part of this fee is exported

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Corporate income tax increase in annual Fee	All registered public corporations in AZ (in 1996, there were 144,307 corporations)(current filing fee is \$50; thereafter, every corp. must file an annual report which costs \$45)	Add \$10 fee for annual report (from \$45 to \$55)	\$1,300,000	Efficiency: Already collected by DOR. Stability: Relatively stable revenue source for the next five years.	
State parks entrance fee increase (41-511.24)	Any user of state parks. Current rate is \$3-\$5 per carload.	Increase 25% \$.75-\$1.25 per carload.	\$1,000,000	Efficiency: Currently collected fee by State Parks. Stability: Will continue to increase, until state parks reach 100% utilization.	Part of this fee is exported
UST registration increase(funds already used for UST Program) (49-1020)	Any owner/operator of an Underground Storage Tank (UST). Presently a \$100 per tank fee is assessed annually on approx. 9,800 tanks.	\$100 additional fee assessed annually.	\$980,000	Efficiency: Already assessed and collected by ADEQ. Stability: Decreasing revenues over time.	There is already a \$100 annual fee assessed on UST owners. This would double costs of UST ownership. Assessed on owners/operators of UST's in state. Primarily businesses. The UST program in conjunction with a task force is considering increasing this fee to increase declining revenue for the program.
Water and dry well drillers registration increase and/or per well drilled fee (45-595 and 49-332)	Anyone filing intent to drill with ADWR. 6,322 notices in 1995	\$10 well notice at intent to drill \$100 registration	\$630,000	Efficiency: Already collected. Stability: Need historical info.	Are these groundwater monitoring wells or for beneficial use?

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Hazardous Waste Facility Registration Fee increase (49-929)	Fee assessed annually on all hazardous waste treatment facility owners/operators that generate \$308,000 annually. Current fee of \$100 to \$2,500/yr, based on quantity of haz.waste. Currently 2,900 businesses registered, with 250 large quantity generators, and 500 small quantity generators.	\$250 to \$5,000 annual fee, based on quantity. (Double current fees)	\$600,000	Efficiency: ADEQ already collects this fee, would not substantially increase administrative burden of payer or agency. Stability: Yield likely to decrease over time due to switching to other chemicals or reporting evasion.	
Industrial Discharge Registration Fee increase (45-616)	Levied upon industrial discharge into community sewer systems. Currently 300 permit holders, @ \$250 per permit. Currently raises \$80,000.	\$1,000 per permit. (Quadruple fee)	\$320,000	Efficiency: ADEQ already collects this fee, would not substantially increase administrative burden of payer or agency. Stability: Yield likely to decrease over time due to decreasing of discharges of industrial discharges.	

PROPOSED INCREASE TO EXISTING FEES (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS/CONCERNS
Water withdrawal fee/water quality assurance fee increase (45-616)	Water providers within the AMA	\$4.24 per acre-ft. Current rate is \$2.12 per acre foot to ADWR Generated \$225,000 last year	\$300,000 (FY 1996)	Efficiency: ADWR already collects, however, there is an exemption for agriculture and beneficial use. Collected annually, due 3/31 Stability: Yield increasing	Paid annually Excludes agriculture
Fertilizer registration fee increase (3-272)	Currently 300 registered establishments. Current rate is \$125/year on each establishment. WQARF receives \$100 from each assessment. Current revenue is \$30,000.	Increase fee to \$250 per establishment. WQARF share of \$225.	\$67,500	Efficiency: This tax is already administered by AZ Dept. Of Ag., would not increase administrative burden. Yield: Likely to decrease slightly as taxes are increased.	Current fee based on 300 regulated facilities There is a linkage between groundwater contamination, and fertilizer/pesticides.

NEW FEES AND TAXES (10.2.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Chlorinated solvents fee (broader than PERC, covers electronics industry) (new)	Wholesale distributors of solvents. Estimated 12 million pounds used in AZ annually.	\$1 per pound	\$12,000,000 (estimated by population)	Efficiency: Could be collected wholesale by DOR or DEQ. Could be administrative burden. Stability: Uncertain because of lack of state wide reporting info.	Gallons vs. Pounds is an issue, who collects is concern. Overall lack of information. Uncertainty of relationship b/t rate and cost increase. This tax likely to be passed on to user. Assume current management practice is similar to past management practices.
Real estate transfer fee based on % of sales of residential, commercial and industrial property (new)	Any buyer or seller of any type of real property in Arizona	Add 0.1 % of sales price	\$11,000,000	Efficiency: Collected at point of sale/transfer, collected by title company, bank, etc. Stability: Subject to business and economic cycles.	Prop. 108 issue. "Anyone who sells real property will be taxed a percentage of the sale price, no matter what the actual value or realized gain from the sale." "The relationship between who pays the tax and who causes the pollution is non existent." "This tax shifts burden from those who caused the pollution to those who may suffer because of it." "There is no relationship between a transaction amount and the ability to pay." Other options is a fee structured with floor on transaction amount and /or ceiling
Commercial insurance policy tax (new to WQARF)	Commercial risk policy-holders	1 % of premiums (surcharge)	\$9,200,000	Efficiency: No increase in existing administrative costs. Stability: Increasing revenue unless substantial drop in commercial property values.	Is there already taxes on insurance company fees; if so, what kind? If rates increase too much, companies may buy insurance out of state. \$1 / business policy; however, no certain numbers on number of policies written (business will benefit) 791 had commercial authorization 485 of them wrote commercial risk \$922 million in premiums generated Volume v. Registration issue. Reevaluate numbers of insurers, policies written?

NEW FEES AND TAXES (10.2.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Golf course fee per round (new to WQARF)	Any golfer who plays rounds of golf in state	\$1 per 18 hole round	\$6,000,000 (\$4,700,000 in Phx)	Efficiency: Collected by owner/operators of golf facility, paid quarterly. Stability: Increasing number of courses and users.	Need better estimate of rounds played per year in state. Applies to pro golfers as well as hackers Part of this fee is exported.
Power generation fee on natural gas, oil, coal, nuclear (excludes federal & hydropower) (new to WQARF)	All kilowatt generators (non-Fed) utility owners	Add one-tenth of a mil per kilowatt hour	\$4,700,000	Efficiency: Relatively easy to administer. Generators will likely pass through to customers. Stability: Relatively stable over time.	This number represents net power generated in 1994 Is this a corporation commission issue? Part of this fee is exported. "Taxes on power generated in Arizona will place AZ utilities at a competitive disadvantage in a deregulated environment."

NEW FEES AND TAXES (10.2.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Hazardous substance tax (Toxic Release Inventory/TRI)	Any business that discharges hazardous substances (313 chemical), based on the TRI (Form R) annual report filed on July 1. Mines pay the bulk of the fee.	\$0.10 (10 cents) per pound of TRI chemical released.	<p>\$3,157,303 based on sum of releases of extremely hazardous substances into air, land, and water.</p> <p>(In 1994 average pounds was 31,573,036.)</p> <p>1993: 14,787,252 1992: 46,554,052 1991: 64,416,978</p>	<p>Efficiency: Businesses discharging 313 chemicals already file TRI report. Likely to substantially increase administrative burden on any state agency assigned to collect.</p> <p>Stability: Relatively stable, but may decrease due to tax, and lack of reporting enforcement.</p>	<p>Concern about administration by an agency, data base quality, future reporting, and artificial reduction in reporting numbers due to tax. Reduced reporting could affect data used for emergency planning and Community Right to Know.</p> <p>An insignificant portion of these chemicals are discharged into water, primarily air and ground. "There may be little relationship between volumes of pollutants "released" for EPCRA 313 purposes and contamination requiring action under WQARF."</p> <p>Concern about lack of enforcement ability of a state agency to audit reports and onsite releases. "This fee would impact mining industry far more than any other industry, and this impact could increase if TRI reporting is expanded, as has been proposed by EPA."</p> <p>Source of these numbers are from Form R, section 5, AZ Total released.</p> <p>Form R information is used for Community Right to Know, and emergency planning.</p> <p>This fee was developed in response to APS proposal for sales tax or user fee on ADEQ identified WQARF hazardous substances.</p> <p>"Based on 1994 data, 56 % of this tax should be paid by a single facility, and 89 % by three facilities."</p> <p>"This is one of three potential new funding sources that will impact exclusively (or primarily) the mining industry (along with the severance tax on metalliferrous minerals and the severance tax on nonfuel minerals)."</p>

**WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
NEW FEES AND TAXES (10.2.96)**

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Short list of Tier 2 Chemicals	Any business that uses specific Tier 2 chemicals and files report with ADEQ	\$0.10 (10 cents per pound) of specific chemicals used or on site.	Ranges from: \$43,000 to \$85,000.	<p>Efficiency: Extremely difficult to administer, utilizes voluntary compliance with reporting requirements.</p> <p>Stability: Revenue likely to decrease if businesses must pay taxes on inventory.</p>	<p>This revenue source is included in an effort to tax on specific chemicals found at WQARF sites such as xylene, toluene 2,3, chlorotoluene, toluene, ethyl benzene.</p> <p>Collecting this tax is problematic. Administrative burdens would increase on both the agency collecting, and the businesses reporting.</p> <p>Could encourage businesses to reduce inventory of these specific chemicals before inventory to reduce taxes.</p> <p>Would require additional administrative and audit personnel at agency collecting.</p>
Septic Tank Annual Fee	All owners of septic tanks in the state of Arizona	\$10 annual fee on the estimated 300,000 septic tanks in Arizona.	\$3,000,000	<p>Efficiency: Collected by counties on registered septic tanks in County, paid with annual property tax assessment.</p> <p>Stability: Decreasing revenue as more septic tanks are closed, and hooked to wastewater systems.</p>	<p>ADEQ has discussed the possibility of assessing a fee on septic tanks. This fee would be kept in each county to be used for subsidizing sewer line hook ups and in conjunction with the State Revolving Fund.</p>
Industrial property recordation surcharge	Any buyer or seller of industrial property in state.	1% of sales price	\$1,500,000	<p>Efficiency: Collected at time of escrow closing.</p> <p>Stability: Cyclical, subject to economic cycles.</p>	Based on 1993 figures, estimated 300 industrial property transfers, with estimated average sales price of \$500,000.

**WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT
NEW FEES AND TAXES (10.2.96)**

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Industrial property recordation flat fee (added 10.2.96)	Any buyer or seller of industrial property in the state.	\$25 flat recordation fee	\$7,500	Efficiency: Collected at time of escrow closing. Stability: Cyclical, subject to economic cycles.	Based on 1993 figures, estimated 300 industrial property transfers.
Dry cleaners fee (new to WQARF)	Any owner or operator of a dry cleaning facility.	\$8 per gallon plus rate based on number of employees	\$1,000,000	Efficiency: Question on how the fee is collected Stability: Revenue declining as operators switch to other chemicals	These numbers from dry cleaning association discussion. This is equivalent to \$1 per pound Dry cleaning proposal based on resolution of liability issue
Property deeds recordation surcharge	Anyone in state recording any type of property deed.	Additional \$10 per recordation.	\$660,000	Efficiency: Recording fees already collected, would be marginal increase in administrative costs to counties. Stability: Cyclical, subject to economic cycles.	Total estimated transactions for 1993: 66,000. Numbers based on arms length sales of property that went through escrow. Limited nexus (if existent) between residential property owners and WQARF remediation.
Above ground tank registration fee (new to WQARF)	Any owner/operator of above ground storage tank facility.	Assess \$100 per year on all registered above ground storage tanks. Estimated 4800 (excluding Phoenix, Glendale, Tempe)	\$480,000 (This does not include 3 metropolitan areas where information is unavailable.)	Efficiency: Administered by State Fire Marshall, collected annually. Stability: Yes, however, may decrease over period.	State Fire Marshall at present time only inspects and oversees removal of above ground storage tanks. This would require additional administrative requirements on State Fire Marshall and businesses. Number of above ground storage tanks may be larger than indicated

NEW FEES AND TAXES THAT GENERATE LESS THAN \$500,000 IN REVENUE (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Wastewater treatment fee (new to WQARF) (48-362)	Any registered owner of a wastewater treatment facility in Arizona.	Increasing scale based on gallons per day. 202 facilities have a 250,000 gpd capacity @ \$500. 60 facilities have a 1 million gpd capacity @ \$1,000. 38 facilities have a 5 million gpd capacity @ \$2,000. 15 facilities have a 5 million gpd capacity @ \$5,000.	\$312,000	Efficiency: Fees are already in place, assessed and collected by ADEQ. Stability: Yes, stable source over the period.	ADEQ already assesses fees on facilities, this would be an additional increase on fees for wwtp. May impact smaller wwtp more than larger facilities with larger user base. Assessed on wastewater treatment facilities based on amount of wastewater processed.
Environmental license plates surcharge (new to WQARF) (28-382)	AZ citizen who desires to purchase environmental license plate. At present 61,000 env'tl plates issued per year.	Add \$5 per plate for DEQ From \$25 to \$30	\$300,000	Efficiency: Already collected. Stability: Potential decrease of revenue as fees increase.	

NEW FEES AND TAXES THAT GENERATE LESS THAN \$500,000 IN REVENUE (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Petroleum license fees	173 petroleum suppliers in Arizona	\$1,000 annually	\$173,000	Efficiency: Business fee already collected by DOR. Some increase in administrative costs. Stability: Stable over time.	Information obtained by ADEQ UST.
Boat fee	Registered boaters both residents and nonresidents	Add \$1 to registration fee (Currently \$4 for resident and \$10 for nonresident)	\$150,000	Efficiency: Already collected, little increase in administrative costs. Stability: Yield stable.	
Severance tax on timber	Timber industry	Increase from 1.5% to 2.0%	\$120,000 (estimated)	Efficiency: Already collected, no increase in administrative burden Stability: Declining	
Income tax checkoff (new to WQARF)	Taxpayers who voluntarily checkoff option to donate	\$1 increments	\$100,000	Efficiency: Already collected, little administrative cost increase Stability: Yield declining	Does not appear to be any more space for another checkoff on tax form
Mortgage lenders annual license fee (new to WQARF) (6-126)	In state: 6 Commercial 196 residential 483 Active Brokers 30 Inactive Brokers	Annual fee. 6 at \$100 196 at \$50 483 at \$10 30 at \$0	\$15,200 (estimate)	Efficiency: Already collected; no increase in administrative burden. Stability: Dependent upon economy and real estate market.	Uncertain on number of loans in the state.

NEW FEES AND TAXES THAT GENERATE LESS THAN \$500,000 IN REVENUE (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
NPDES fees (new to WQARF)(49-202)	Additional fee on holders of NPDES permits. 144 permits currently	Additional \$100 annual fee	\$14,400	Efficiency: Already collected by ADEQ Stability: Expected to remain stable for the period	Facilities already pay for NPDES and APP permits. Process takes 2-3 years Assessed on any facility needing a NPDES permit.

WQARF POTENTIAL FUNDING SOURCE PRESENTATION FORMAT

NEW FINANCING ALTERNATIVES/BONDING (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Title 48 Redevelopment district	Owners of property within the boundaries of the district	Rate based on costs of cleanup, amortization costs, and interest	Revenue to service debt.	<p>Efficiency: Administration costs for legal, bond counsel, etc. Heavy administration costs and burden during set up, minimal after implementation of special district.</p> <p>Stability: Revenue stability based ability to pay within special district.</p>	<p>Allows the business inside the special district boundaries to pay for remediation over a long period, based on amortization of debt.</p> <p>If any affected businesses relocate or go bankrupt, other businesses may have to pay additional costs.</p> <p>Cost consideration for legal and bond counsel, underwriters, trustees, etc.</p> <p>Concern about individual credit worthiness of each district, may require bond insurance.</p> <p>Allows for cleanup in short period of time, while paying for costs of cleanup over a long period of time.</p> <p>May be cheaper to finance because of inflation.</p>
Bonds to finance cleanup (brown fields financing, and tax increment financing)	Owners of property in special districts.	Each business pays a share of principal and interest for bonds to clean up sites.	Revenue to service debt.	<p>Efficiency: Same as for Title 48 Redevelopment District.</p> <p>Stability: Revenue stability based on ability to pay within special districts.</p>	<p>Bonding could be used to finance brown field clean ups or for Tax Increment Financing (TIF's)</p> <p>Property tax increases could be earmarked for payment of principal and interest.</p> <p>Requires setting up of special districts.</p> <p>Cost consideration for legal and bond counsel, underwriters, trustees, etc.</p> <p>Concern about individual credit worthiness of each district, may require bond insurance.</p> <p>Allows for cleanup in short period of time, while paying for costs of cleanup over a long period of time.</p> <p>May be cheaper to finance because of inflation.</p>

FEES AND TAXES/REVENUE GENERATION UNKNOWN (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Structural pest applicators - surcharge on business licensees (new to WQARF) (32-2317)	Licensees, as administered by AZ Structural Pest Control Board (90/10 Agency)	Unknown	Unknown	Efficiency: Stability:	Licensees do not report by volume. Range of licenses is \$20 for annual renewal to \$125. Fee for termite report is \$8 per house. Uncertain of rate adjustment, and impact.
Motor oil, batteries, anti-freeze surcharge (new to WQARF) (batteries: 44-1323)	Retailer collected?	Unknown	Unknown	Efficiency: May be excessive reporting collection burden. Stability: Unknown	
Off road recreational vehicles surcharge (new to WQARF) (28-303.01)	All purchasers of off-road vehicles at retail level.	Unknown	Unknown	Efficiency: Could be collected at retail point of sale. Stability: Unstable b/c of discretionary expenditure.	Doesn't look like too much cash would be generated. One time fee, not annual
Auto salvage fee (tied to auto shredder fluff) (new to WQARF) (title 28 chapter 8)	Auto salvage businesses	Unknown	Unknown	Efficiency: A fee is already charged to salvage auto. Stability: Potential decrease of revenue as fees increase.	Profit margins on auto salvage are minimal. Increasing fees could create a loss.
Medical waste fee (new to WQARF) (49-761)	Uncertain how to assess.	Unknown	Unknown	Efficiency: Uncertain on amount of medical waste or methods of disposal. Stability: Uncertain.	Difficulties in defining medical waste and no means of tracking amount of medical waste disposed of.

FEES AND TAXES/REVENUE GENERATION UNKNOWN (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Bottle tax	Wholesale distributors of bottles and containers.	Per container surcharge. Amount unknown.	Unknown	Efficiency: Increase in reporting and administrative burden on whole sale distributors. Stability: Yield unknown.	Michigan generates \$30-\$40 million annually on a bottle tax.
Release and Exit Fee from cleanup liability	Any business wishing to exit from liability for cleanup.	To be negotiated with businesses.	Unknown	Efficiency: Administrative/legal burden on both business and agency. Stability: Unknown, but likely to be large at beginning of program, tapering off over time.	\$2,000,000 of gross revenue is potential benchmark to pay exit fee. \$50,000,000 of revenue has been suggested, but uncertain as of basis for this number.
Capital stock and franchise fee	All corporations and businesses in Arizona who issue stock or franchises	Unknown, either on per business basis or amount of stock/franchise s	Unknown	Efficiency: Difficult to administer. Stability: Unknown revenue, but subject to business and economic cycles	Only state that uses this method is Pennsylvania and could require tremendous administrative burden on payers and DOR.
Waste site closure fee	All owners or operators of waste sites.	Unknown	Unknown	Efficiency: ADEQ already collects a range of fees on landfills. Stability: Decreasing b/c number of landfills decreasing.	

FEES AND TAXES/REVENUE GENERATION UNKNOWN (10.1.96)

FUND SOURCE	WHO PAYS	RATE	REVENUE GENERATED	EFFICIENCY STABILITY	COMMENTS
Connection to utility service	Either municipalities or utility operations	Per hook up charge	Unknown	Efficiency: Uncertain on best method to collect Stability: Depends on business and economic cycles and number of new homes	
Inspection / certification for new disposal sites	Any owner/operator of a municipal or private facility.	Unknown	Unknown	Efficiency: ADEQ already collects a range of fees on landfills. Stability: Decreasing b/c number of landfills decreasing.	
Wetlands permit fees (401 certificate fee)	Anyone wishing to build or develop in possible wetlands?	Unknown	Unknown	Efficiency: Wetland permit fees already collected, combine with NPDES fees. Stability: Unknown	Likely payers are for new developments that require clearing. Difficult to determine exact amount of fees generated.
Sales tax on remediation services	Any contractor or consultant engaging in remediation activities.	Unknown	Unknown	Efficiency: Uncertain how to collect Stability: Unknown	Difficult to define what exactly is contracting and what is not.
Used oil (increase existing fee) (49-814)	Any burners of used oil	\$0.20 per gallon. Off spec. \$0.06 per gallon	Unknown	Efficiency: ADEQ already collects fees. Stability: Uncertain	Uncertain of best method to collect and administer, unknown amount of revenue generated.



ARIZONA MINING ASSOCIATION

CHUCK SHIPLEY
President

August 28, 1996

Sandy Price, Esq.
Sacks Tierney P.A.
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14th Floor
Phoenix, Arizona 85012

Re: Comments on Select Proposals from Funding Subcommittee of
Groundwater Task Force

Dear Ms. Price:

The Arizona Mining Association ("AMA") appreciates the opportunity to submit the following comments to the Groundwater Task Force Funding Subcommittee on its initial list of new or increased fees or taxes being considered as potential sources of revenue for the WQARF program.

I. General Comments

A. The rationale for public funding of the WQARF program lies in the fact that the parties primarily responsible for creating the contamination cannot be found or are otherwise financially unable to pay for the remediation — thus the term "orphan" sites. It is because of this that some source of public funding is deemed necessary. It is appropriate, therefore, that the source of revenue be general and not from specific business or non-business sources that cannot be identified as having contributed more than anyone else — or even contributed at all — to creating the condition.

B. Only one of the 28 existing WQARF priority sites, Pinal Creek, is listed as being caused by mining activities. Pinal Creek, however, is not an *orphan* site. Unlike many other WQARF sites, some of the responsible mining companies are voluntarily conducting remediation activities. These companies are paying not only for remediation, but also the cost of ADEQ oversight of the remediation. Therefore, no WQARF monies are being spent on the site. In fact, at a recent Task Force meeting, Ethel DeMarr of ADEQ cited this remedial activity as a success story under the current WQARF program.

A review of the WQARF priority list — other than Pinal Creek — discloses the following:

1. The overwhelming number of sites are located in the metropolitan areas of Maricopa and Pima Counties — none of which give any indication of having been created in whole or part by mining activities.
2. None of the few remaining sites in Santa Cruz (Nogales), Gila (Payson), Pinal (Casa Grande), and Graham (Safford) indicate the conditions were caused by mining activities.
3. The conditions existing in the priority sites list appear to be the result of public landfills and disposal sites or industrial, manufacturing or agricultural activities.

The absence of any other mining-related WQARF sites on the priority list together with the current clean-up being carried out by mining companies at Pinal Creek constitute sufficient reasons to exclude a specific tax on mining to fund the clean up of existing *orphan* sites.

II. Comments on Specific Taxes or Fees

AMA offers the following comments on several of the proposed fees or taxes of concern to the mining industry. The comments are structured so as to respond to the six questions included in your August 7 memorandum to Task Force members.

A. Severance Tax (on Metalliferous or Nonfuel Minerals)

The chart entitled "New Fees and Taxes" includes two proposed versions of a mining severance tax: an increase in the existing severance tax from 2.5% to 3%, and a new severance tax on all nonfuel minerals. As a practical matter, both taxes would be borne primarily by the state's four major copper producers (Asarco, Inc., BHP Copper, Inc., Cyprus Climax Metals Company and Phelps Dodge Corporation). Unless the comments below are specifically tied to one version of the severance tax, the comment applies to both of the proposed severance taxes.

1. Overall, is the proposed fund source a fair tax or fee? Why or why not?
 - a. No. If imposed, the severance tax would result in a single industry contributing the major portion of the increase in WQARF

funding. Using the \$15 million annual figure that has been mentioned as the funding requirement for the first several years of the program, a severance tax on metalliferous minerals would result in mining companies providing approximately 50% of annual WQARF funding, even though they have not been shown to be responsible in any way for even one so-called *orphan* site. (Using the same \$15 million figure, under the severance tax on nonfuel minerals, mining companies would be paying approximately 27.8% of annual WQARF funding.)

- b. Currently, Arizona's severance tax is 2.5% times 50% of the gross value of production, less out of state costs. It is in large measure a value added tax imposed on the costs of production irrespective of any sale. Except for timber, Arizona imposes no production tax on any other commodity. Nor is any value added tax imposed against any other industrial or manufacturing process in Arizona.

Further, it is an anti-conservation tax. The price of copper and other minerals are determined by international markets. Whether ore bearing material is an economic *resource* or *waste* depends on the unit cost of production. Unit costs can be controlled in only two ways: (1) by mining higher grade material, or (2) by lowering production costs.

Increased mining costs — which would include severance taxes — may cause the producer to raise the "cut off" grade of material being mined which shortens the life of the mine and consigns what might have been a *resource* to a *waste* dump.

The first option may not be available to a marginal mine, and the only alternative is to shut down when prices fall below costs. That is exactly what happened in the mid-eighties in Arizona when mining employment dropped from 25,000 to 10,000 and more than a dozen operations shut down and have never reopened.

- 2. Is there a relationship between the proposed fund source and the cause of the pollution; if so, what is the relationship?

No. As noted above, mining companies are identified as responsible parties at only one (Pinal Creek) of the 28 existing WQARF priority sites, and some of the responsible mining companies are paying for that site remediation. Therefore, there is no relationship between the proposed fund source (severance tax) and existing groundwater pollution at other WQARF priority sites.

3. Is there a relationship between the proposed fund source and the benefit of clean water and soil; if so, what is the relationship?

No. Mining companies do not benefit directly to any greater or lesser extent than the population in general from clean water and soil. Indirect benefits actually may be less in rural areas, where mines typically are located, than in metropolitan areas. Groundwater cleanups in metropolitan areas may result in greater increases in property values (and therefore tax revenues) than would cleanups in rural areas.

4. Does the fund source create an impact on business competitiveness; if so, please describe the impact?

Yes. Arizona mines and mineral production compete with international producers as well as other domestic production. As previously indicated, producers cannot control price, and taxes which are a cost of production cannot be passed on to the purchaser. If production costs in Arizona are higher or the ore grades are lower than those of other producers, then Arizona producers are at a competitive disadvantage.

In 1989, the Joint Select Committee on State Revenue and Expenditures (Fiscal 2000 Commission) submitted a Report which contained the following statement relating to the Arizona mineral severance tax:

Arizona's mining severance base is also defined more broadly than most other states; five states allow the deduction of costs incurred in extracting minerals, and another four states exempt a portion of the gross value of production before levying the tax. These higher taxes may place mineral production in Arizona at a competitive disadvantage relative to other states. (Emphasis supplied)

At that time, the then-Governor had recommended increasing the severance tax to 5% "to make it consistent with the sales tax".

The Fiscal 2000 Commission Report stated:

Increasing the severance tax rate to 5 percent would not enhance neutrality, since the severance tax is fundamentally different from the general sales tax. In addition, raising the mining severance tax rate could place the State at a competitive disadvantage relative to other states, since the current rate is already somewhat higher than average. (Emphasis supplied)

The attached Table A shows the severance tax imposed by the eight western states in the Rocky Mountain Region.

Currently, Arizona, New Mexico and Utah are the major domestic copper producing states. Of the three, Arizona imposes the highest severance tax. It also has a higher severance tax than the remaining five states in the Rocky Mountain Region (Nevada, Wyoming, Colorado, Idaho and Montana).

In view of the foregoing, it would be inequitable and economically unwise to increase the mineral severance tax to fund a clean-up of WQARF *orphan* sites that were not created by mining activities.

It seems obvious that the State should prefer a healthy industry paying income taxes on profits rather than a sick one paying increased severance taxes on losses.

5. Do you have comments on the way the tax was structured (e.g., whether the fee is per unit or percentage; whether the rate seems reasonable)?

For the reasons expressed above, we believe the proposed increase is totally unreasonable.

6. Other comments.

- a. Because the severance tax on metalliferous minerals has been in existence for over a decade, the analysis of this tax should be included on the chart entitled "Increase in Existing Fees" rather than the chart entitled "New Fees and Taxes."
- b. Currently, 80% of revenues from the severance tax on metalliferous minerals are allocated to cities, counties and states (with the state receiving 34.49%, counties receiving 40.51% and incorporated municipalities receiving 25%). The remaining 20% of revenues are deposited in the general fund for public educational purposes. See A.R.S. § 42-1465(B)-(C). Raising the existing rate from 2.5% to 3%, with the additional .5% all going to WQARF, cannot be justified.
- c. The two severance taxes (along with the tax on EPCRA § 313 releases) fall wholly or primarily on the mining industry. No other industry is targeted so frequently in the list of funding ideas. Furthermore, if any of these options ultimately is included as part of the final WQARF funding mix, the disproportionate impact on the mining industry will be magnified and adversely affect the industry's competitive position with other domestic and international producers.

B. Tax on EPCRA § 313 Releases

1. Overall, is the proposed fund source a fair tax or fee? Why or why not?
 - a. No. Releases reported under EPCRA § 313 may have little if anything to do with soil or water contamination that will need to be cleaned up under WQARF. EPCRA releases also include air emissions which are stringently regulated under the Clean Air Act. Under the Clean Air Act, smelters collectively pay hundreds of thousands of dollars each year in fees for such emissions, which are very unlikely to cause soil or water contamination that should be addressed by WQARF. Consequently, any additional tax on such emissions would be duplicative of existing Clean Air Act fees and unreasonably burdensome on many industries, including

mining, for chemicals that do not threaten soil or groundwater resources.

- b. Further, EPCRA § 313 reporting applies only to manufacturing facilities in SIC Codes 20 through 39. Although the range of facilities required to report may expand in the future, it still is likely that certain types of facilities that cause significant "releases" to the environment will not be subject to EPCRA reporting. Thus, a tax on EPCRA § 313 releases impacts only a segment of the overall universe of facilities releasing § 313 chemicals.

2. Is there a relationship between the proposed fund source and the cause of the pollution; if so, what is the relationship?

No. The releases that would be taxed most heavily under this proposal are not those that have caused soil or water contamination that will need remediation under WQARF. The releases from mining facilities are deposits of slag at on-site slag piles and, to a much lesser extent, air emissions. Slag is a glass-like material in which the metals being reported are tightly bound in a vitreous matrix and present essentially no danger of leaching. As a result of its innocuous nature, slag qualifies as inert material under Arizona's solid waste and APP statutes, passes the Toxicity Characteristic Leaching Procedure test (and hence is not hazardous) and is one of only twenty mineral processing wastes that are exempt from RCRA because they are large volume, low hazard wastes. Nevertheless, under an EPCRA § 313 tax, the Arizona copper industry would pay in excess of \$2 million per year for releases of slag (based on 1994 data), even though these releases pose no threat to soil or water.

3. Is there a relationship between the proposed fund source and the benefit of clean water and soil; if so, what is the relationship?

Companies that report releases under § 313 typically do not benefit any more (or less) than the population in general from clean water and soil.

4. Does the proposed fund source create an impact on business competitiveness; if so, please describe the impact?

Yes. For all of the reasons previously expressed in Section II.

5. Do you have comments on the way the tax was structured (e.g., whether the fee is per unit or percentage; whether the rate seems reasonable)?

a. No.

III. Recommended Funding Options

The primary purpose of the water quality assurance revolving fund is to supply money for the cleanup of *orphan* sites. *Orphan* sites are a societal problem and should be funded by the general public and not just by a select group of business or non-business sources.

The original legislation, A.R.S. § 49-282A, recognized the general nature of the obligation by stating the money should come first from legislative appropriation plus certain user type fees that bore some relationship to the problem. For example: fees on water use and fees related to fertilizer, pesticide, hazardous and industrial discharges. Rather than imposing fees on all 313 chemicals — most of which pose no threat to groundwater — it would be more appropriate to impose fees on only those chemicals which are identified as being in groundwater or which are driving groundwater remediations.

The State's primary sources of revenue are the property, sales and income tax. Allocating some portion of these revenue sources — or increasing them — also would be appropriate if the risk to public health justifies it.

Since landfills and other disposal sites make up a large proportion of the existing WQARF sites, landfill tipping fees might be an appropriate way to augment the funding of WQARF. Such fees likely would be passed through to users of disposal facilities and will not disproportionately impact any one industry or community.

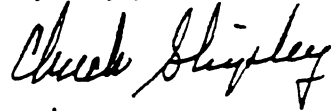
Except for the gasoline tax, which use is restricted by Constitution to highway purposes, other attempts to dedicate a tax or revenue source usually fail to produce any legitimate relationship between the source and purpose. Allocating money from the State Lottery

Sandy Price, Esq.
August 28, 1996
Page -9-

to the Heritage Fund is a classic example of such failure. The result is a loss to the general fund which can only be made up by an increase in general taxes.

Thank you for the opportunity to comment on the ideas generated by the Funding Subcommittee to date. Please feel free to call if you have any questions on these comments.

Very truly yours,



Chuck Shipley
President



James M. Bush
Chairman
Government Relations Committee

COMPARISON OF SEVERANCE TAXES OF 8 WESTERN STATES

STATE	SEVERANCE TAX
ARIZONA	Taxable Value = 50% of Gross Value of Mineral Production Less Out of State Cost Tax Rate: 2.5%
NEW MEXICO	(1) Severance Tax: Taxable Value = 16-2/3 of Gross Value of Mineral Production Tax Rate: 1/2 of 1% (i.e. .005) (2) Processor Tax: Gross Value of Mineral Production Less Out of State Costs Tax Rate: 3/4 of 1% (i.e. .0075)
UTAH	Taxable Value = 30% of Gross Value of Mineral Production Tax Rate: 2.6%
NEVADA	Taxable Value = Gross Value of Production Less Specified Deductions Tax Rate: Taxed at the Same Rate as Other Property 1995 Average Tax Rate: 1.97%
WYOMING	Taxable Value = Gross Value of Production Less Production Costs Tax Rate: 2% of Taxable Value
COLORADO	Taxable Value = Gross Value Upon Extraction (No Value Added by Processing) Tax Rate: 2.25% of Taxable Value Over 11 Million
IDAHO	Taxable Value = Net Value of Ore Mined Tax Rate: 2.0% of Net Value
MONTANA	Taxable Value = Gross Value of Product Tax Rate: First \$250,000 No Tax More than \$250,000 1.81%

Source: COMMERCE CLEARING HOUSE
STATE TAX GUIDE

September 6, 1996

Ms. Sandy Price
Sacks Tierney
Chair of Groundwater Funding Subcommittee
2929 North Central Avenue, 14th Floor
Phoenix, Arizona 85012

Dear Ms. Price:

It has come to our attention through the joint Government Affairs Committee, representing the Greater Phoenix Building Owners & Managers Association and the Greater Phoenix Institute of Real Estate Management regarding the intent of a proposed real estate transfer tax. Koll represents more than 60 owners of commercial real estate in Maricopa County. In representation of our clients you should be aware that we are strongly against the proposed real estate transfer tax intended to fund clean-up of orphaned groundwater sites.

While we understand the need for clean ground water supplies, we see no relationship to the source from which you propose to collect funds. It is our position that those who contaminate and those who require water from an otherwise contaminated supply are those who should bear the cost of such projects. Those simply buying real estate (residential or commercial) should not be penalized by being taxed on a transaction that has no relationship to contaminated ground water supplies.

Again, we support the objective, however we strongly believe that the funds required should be generated from sources having a direct relationship to the contaminated water, whether by cause or use needs.

Sincerely,



Ronald E. Roeske, CPM®
Senior Vice President
Arizona Commercial Division

cc: Terry Cuellar, CPM
Kerry Kimball, CPM



September 4, 1996

Sandy Price
Sacks Tierney
Chair of Groundwater Funding Subcommittee
2929 N. Central Avenue, 14th Floor
Phoenix, AZ 85012

Dear Mrs. Price:

It has been brought my attention that your subcommittee is proposing a real estate transfer tax intended to fund clean-up of orphaned groundwater sites. I strongly oppose such a tax.

Everyone understands the need for clean ground water supplies, however I see no relationship to the source from which you propose to collect funds. I believe that those who contaminate and those who require water from contaminated supplies should bear the cost. Individuals buying real estate should not be penalized by being taxed on a transaction that has no relationship to contaminated ground water.

I support the objective, however I believe that the funds required should be generated from sources having a direct relationship to the contaminated water, whether by cause or use need.

Sincerely,

Tom Tucker
Director of Franchise Sales

September 4, 1996

Ms. Sandy Price
Sacks Tierney
Chair of Groundwater Funding Subcommittee
2929 N. Central Avenue, 14th Floor
Phoenix, AZ 85012

Dear Ms. Price:

Would like to take a few minutes of your valuable time to voice my objection to the proposed real estate transfer tax intended to fund clean-up of orphaned groundwater sites.

I am in strong agreement with BOMA, that those who contaminate and those who require water from an otherwise contaminated supply are those who should bear the cost of such projects.

Truly yours



Turner B. Martin
President

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* Admitted to practice in
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September 4, 1996

**VIA FACSIMILE 279-2027
AND FIRST CLASS MAIL**

Sandra E. Price, Esq.
Sacks Tierney, P.A.
2929 N. Central Avenue
14th Floor
Phoenix, Arizona 85012

Re: Arizona Groundwater Task Force

Dear Ms. Price:

It is my understanding that you are acting as chairperson of a subcommittee of the referenced group to consider possible sources of new funding to support the costs of cleaning up various contaminated sites under the Water Quality Assurance Revolving Fund ("WQARF"). Apparently, a suggestion for such funding has been made to impose a one dollar tax on each round of golf played in the state. The summary chart faxed to me estimates such a tax would raise about \$6 million annually, and would be easily collected through the course operators. On the issue of equity, the chart indicates it would be equitable as it "applies to pro golfers as well as hackers."

Our firm has acted as a lobbyist for the Arizona Golf Association on several issues in the past, and we also represent a number of golf course developers and operators. The purpose of this letter is to express objections to the concept of taxing rounds of golf to pay for totally

PAE-15478.

FENNEMORE CRAI

Sandra E. Price, Esq.
September 4, 1996
Page 2


unrelated environmental cleanups. The golfers playing in Arizona are already subject to all the other taxes imposed on other citizens. The tourists playing resort and similar courses are all charged sales taxes on their green fee and other charges, which taxes on a typical single round during the winter at a top course are about \$10.00

To single out golfers or any other arbitrarily selected group of individuals has the effect of disproportionately imposing the cleanup costs on groups who have no more responsibility for the costs than the general population. A tax on each round of golf played makes as much sense as a tax on each pizza sold or each horse owned or rented. In other words, it is inequitable to tax certain groups to pay for a problem that should be paid for by the polluters, if they can be identified. If not, it would seem that paying the costs of cleanup from the general fund would be far more equitable.

Please put me on a list of persons to be informed as the recommendations of your subcommittee mature. Thank you for considering the disappointment of the golfing community in being potentially singled out on this matter.

Very truly yours,

FENNEMORE CRAIG

A handwritten signature in dark ink, appearing to read "Philip A. Edlund", written over a horizontal line.

Philip A. Edlund

PAE:llf



**IREM / BOMA
GOVERNMENTAL AFFAIRS COMMITTEE**



331-2509

August 16, 1996

Sandy Price
Sacks Tierney
Chair of Groundwater Funding Subcommittee
2929 N. Central Avenue, 14th Floor
Phoenix, AZ 85012

Dear Mrs. Price:

The joint government Affairs Committee, representing the 200 members of the Greater Phoenix Building Owners and Managers Association and the 250 members of the Greater Phoenix Institute of Real Management, is strongly against the proposed real estate transfer tax intended to fund clean-up of orphaned groundwater sites.

While we understand the need for clean ground water supplies, we see no relationship to the source from which you propose to collect funds. It is our position that those who contaminate and those who require water from an otherwise contaminated supply are those who should bear the cost of such projects. Those simply buying real estate (residential or commercial) should not be penalized by being taxed on a transaction that has no relationship to contaminated ground water supplies.

Again, we support the objective, however we strongly believe that the funds required should be generated from sources having a direct relationship to the contaminated water, whether by cause or use need.

Very Truly Yours,

Terry Cuellar

Terry Cuellar, CPM
Co-Chairperson

Kerry Kimball

Kerry Kimball, CPM
Co-Chairperson

Received Time Aug. 16. 4:07PM

*Tracy or
Cuellar Realty Services, Inc.
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Phx 85012*



Task 10
Final
Comments

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Comments on WQARF Funding Alternatives – Real Estate Transfer Tax

By Daniel R. Miller, Vice President Government Affairs, Arizona Association of REALTORS®

1. *Who bears the burden of the tax or fee?*

Anyone who sells real property (single-family residential, multi-family residential, vacant land, industrial or commercial property) will be taxed a percentage of the sale price, no matter what the actual value or realized gain from the sale. In some cases, there may be no gain – even a loss – but the seller, and ultimately the buyer, will pay this tax.

Often a piece of land will be sold several times before it reaches its eventual long-term owner. In the case of developable land, a sales tax would be imposed when the large parcel is sold, when it is sold as large portions to a homebuilder, and then again when it is sold to the home buyer. The effective tax increases with each sale.

One population directly affected includes those marginal home buyers who have scraped together just enough to finance their first home, only to be confronted with a new upfront fee to be paid in cash or financed for 30 years. Part of the cost will be hidden, as previous transfer taxes have been rolled into the price of the home.

Apartments will similarly be affected as will all commercial real estate transactions, increasing costs to business.

2. *Rate the connection or relationship between who pays the tax and who caused the pollution as: strong, medium, weak, nonexistent.*

Nonexistent.

The burden of cleaning up a polluting plume in southeast Phoenix or a landfill, whose pollution occurred 20-30 years ago, should not be placed on home buyers, especially home buyers who may be new to Arizona.

3. *Do those who pollute more pay more of the tax?*

Most pollution in WQARF areas was caused by businesses that will be least affected by a real estate transfer tax. In fact, this tax would completely shift the burden from those who caused it to those who may suffer because of it.

4. *Rate the connection or relationship between who pays the tax and who benefits from the cleanup of pollution as: strong, medium, weak, nonexistent.*

Weak to nonexistent.

Society as a whole benefits from a cleaner environment, yet current and future owners of the actual Superfund area properties will benefit the most. This tax spreads



the tax among those who buy and sell real estate. To reflect the benefit to society as a whole, a better source would be the state general fund.

5. *Are all taxpayers with the same ability to pay, charged the same amount of tax?*

No, since the tax is on the property sales price, not the increase in value or "profit". Some sellers may be paying a tax on property where no profit was realized. In times of a depressed real estate market, the impact of a transfer tax may actually help determine whether a sale goes through or not.

Sales by elderly homeowners, including those with little or no income, will still be hit with the transfer tax.

6. *Are taxpayers with more ability to pay charged a higher proportion of the tax? (is it progressive?)*

"Ability to pay" assumes income or personal worth sufficient to bear a financial burden. There is no relationship here between a transaction amount and ability to pay.

The tax imposed is based on the sales price of a property, which may be more or less than it was last purchased for, and may have no relationship to "profit" from the sale. Some land will also be resold several times before it ends up in its highest and best use. Transfer tax would be imposed on all transfers, not just those in which the buyers and sellers have other assets to cover the expense.

The most progressive tax is the income tax.

and

7. *Political Reality*

The Arizona Association of REALTORS® has twice before defeated proposals to institute a tax like this. The association's 19,000 members statewide feel very strongly about this and would strongly contest any such a plan. This, coupled with the supermajority required to pass such a new tax, and the signature of a governor loathe to endorse a new tax, would make a proposal nearly impossible to achieve.

8/8/98

westcor

September 10, 1996

Gary D. Price, CPM, RPA
Director, Property Mgt.
Office Division

Sandy Price
Sacks Tierney
Chair of Groundwater Funding Subcommittee
2929 N. Central Avenue, 14th Floor
Phoenix, AZ 85012

Dear Mrs. Price:

As a member of IREM and BOMA I would like to voice my opinion against the proposed real estate transfer tax intended to fund clean-up of orphaned groundwater sites.

My position is that while we do indeed have a need for clean ground water supplies, I do not agree that anyone buying real estate should be taxed for something that has no relationship to contaminated ground water supplies. I believe the funds required should be generated by those who are contaminating or persons requiring water from otherwise contaminated water supplies.

Sincerely,



Gary Price

GDP/mj

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City of Phoenix
OFFICE OF ENVIRONMENTAL PROGRAMS

September 11, 1996

Ms. Sandy Price, Esq.
Sacks Tierney, P.A.
2929 N. Central Avenue
14th Floor
Phoenix, AZ 85012

Post-It® Fax Note	7671	Date	# of pages
To	Sandy Price	From	Ron Stoltz
Co./Dept.		Co.	
Phone #		Phone #	256-5601
Fax #	279-2027	Fax #	



Re: Comments on Draft WQARF Policy Issues, WQARF Funding Policy Work Group

Dear Ms. Price:

Thank you for the opportunity to review this document. The Work Group has done an admirable job of summarizing their debate and presenting well-reasoned recommendations on difficult issues. In general, I believe the City of Phoenix is in support of these recommendations. The following comments relating to the description of several of the issues are offered in the hope that they will be of interest in preparing a final draft Policy Issues document.

Periodic Review: Creation of an advisory committee will result in additional demands upon ADEQ to staff the group, respond to inquiries, and produce various reports and program analysis. The recommendation to create the committee should be accompanied by a recommendation to fund at least 0.25 FTE at ADEQ to support the functions of the committee.

Sources of Funding: It is misleading to suggest that a responsible party that is funding remedial actions is somehow subject to double taxation if they also must contribute to the WQARF program through a tax. In actuality, the taxes would be used to pay program costs for which the responsible party would otherwise be liable and would ultimately need to pay for, absent another funding source.

Beneficiaries: First, not all water users benefit from WQARF reform; only those whose obtain their water from a supply impacted or threatened by a WQARF-regulated release would benefit. The report notes elsewhere that a tax on the entire business community would impact many entities who do not use the offending chemicals; consistency demands that the report note the similar inequity of imposing a tax on all water users. Second, it is important to remember that water users benefit only relative to the status quo, i.e. an impacted supply. The water users no more "benefit" from the correction past damages than an automobile accident victim "benefits" from medical treatment. In either case, the preferred alternative would be to have the injury not occur in the first place, and compensation is normally desired from the offending party or their insurer.

Ms. Sandy Price
September 11, 1996
Page 2

Retention of existing fees: There are a large number of existing revenue sources for the WQARF program, many of which provide relatively minor amounts of funds. I recall there was some discussion of evaluating the possibility of eliminating certain minor sources that are least cost-effective to collect. I believe this approach is good fiscal policy, and encourage the group to incorporate this evaluation into the recommendation.

Thank you for your consideration.

Sincerely,



Donn M. Stoltzfus, P.G.
Environmental Programs Specialist

DMS:mb
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arizona municipal water users association

4041 north central avenue • suite 900 • phoenix, arizona 85012 • phone (602) 248-8482 • fax (602) 248-8423

October 8, 1996

Ms. Sandy Price, Esq.
Co-Chair, WQARF Funding Subcommittee
Sacks Tierney P.A.
2929 N. Central Avenue, 14th Floor
Phoenix, Arizona 85012

RE: WQARF Municipal Water Use Tax

Dear Ms. Price:

On behalf of the Arizona Municipal Water Users Association (AMWUA), please first accept our personal thanks and professional admiration for the efforts of yourself, Scott Davis, Doug McAllister, and Dal Moellenberg in shepherding the WQARF Funding Subcommittee and its working groups. You can all be justifiably proud of the subcommittee's work products submitted to the Groundwater Task Force.

Of course, our thanks and admiration, while unqualified, does not automatically translate into unconditional (ungrudging?) support for every recommendation in the submitted work products. AMWUA still has concerns about the status of the WQARF municipal water use tax and how others in the "WQARF-community" may interpret the recommendations of the WQARF Funding Subcommittee to suit their own agendas. For example, turn to the recommendations developed from the questions concerning who should fund the WQARF program and whether the existing fees and taxes financing WQARF should be retained.

- **Should the existing fees and taxes financing WQARF be retained?**

Recommendation: "The *existing structure* of WQARF fees and taxes should be retained, and recognition should be given to which taxpayers are already contributing to the WQARF as the funding mix for additional sources is developed." (Emphasis added)

Comment: Even though municipal water users would undoubtedly prefer that the municipal water use tax be repealed or reduced, AMWUA interprets "existing structure" of WQARF fees and taxes as referring to the existing WQARF municipal water use tax rate of \$0.0065 per 1,000 gallons. Any increase of that rate will be exceedingly difficult to justify to the public. AMWUA would in no uncertain terms strongly oppose any interpretation of "existing structure" of WQARF fees and taxes that is linked to a percentage contribution to the WQARF. That the contribution of the municipal water use tax to the WQARF approaches thirty percent for the FY 93 - 96 period only highlights WQARF's existing inequities.

In addition, and notwithstanding that interest charged on WQARF funds advanced to political subdivisions for remedial action are included in the WQARF funding mix, AMWUA interprets "existing structure" of WQARF fees and taxes as not addressing the issue of whether WQARF funds so advanced are grants or loans. ADEQ, for some reason, has apparently made a policy decision that funds so advanced are loans. AMWUA believes the funds so advanced should clearly be considered as grants. Municipal water users have not only contributed significantly to the fund from which the so-called "loans" are made, they are required by law to match any funds received. (ARS Section 49-282.G) I am reminded of the tale about a person, who has donated substantial sums to his/her church over the years, appearing at the church door one Sunday morning for some spiritual remedial action only to find the pastor charging admission.

- **Who should fund the WQARF program?**

Recommendation: "Fairness dictates that the first sources of funds for WQARF remediation come from those who polluted, those who handle and dispose of toxic chemicals, those who choose to use the products manufactured from these chemicals, and those who receive relief from liability, if any, provided by WQARF reform. To the extent reasonable taxes on those sources do not create adequate funding, the general public, including parties that benefit from WQARF remediation, may need to supplement the program funding scheme....."

Comment: The first sentence of the recommendation is likely to receive considerable support from the general public. The second sentence, however, is problematic. Since "reasonable" is most often in the eye of the beholder, it would be imprudent for anyone to interpret the second sentence as an unconditional pledge by municipal water users to backstop the WQARF program through additional water use taxes, much less a pledge by the general public to save WQARF through a new sales tax. On the other hand, perhaps one should not read too much into this recommendation. Maybe the recommendation is no more than the recognition that even though everyone may not be part of the problem, there is a place for everyone in the solution.

Again, our thanks and admiration to you Sandy, and Scott, Doug and Dal. If you have any questions, please contact me at your earliest convenience.

Yours truly

A handwritten signature in black ink, appearing to read "Bob McCain". The signature is fluid and cursive, with the first name "Bob" being more prominent than the last name "McCain".

Bob McCain
Program Manager

cc: Groundwater Task Force
AMWUA Water Resources Advisory Group

JRM:mjr
h:\bob\fund-2.gtf



October 4, 1996

Ms. Sandy Price
Chair, WQARF Funding Subcommittee
Sacks Tierney P.A.
2929 N. Central Avenue, 14th Fl.
Phoenix, Arizona 85012

Subject: WQARF Reform: Funding Issues

Dear Ms. Price:

Thank you very much for keeping the City of Glendale informed on significant WQARF reform issues as they arise in the Groundwater Task Force planning process. We sincerely appreciate your willingness to put forth the extra effort to ensure an open process.

To date, the City of Glendale has chosen not to provide written comments on the initial draft concept papers and related issues as they were being prepared by the various subcommittees. The City wanted to more fully understand the options and proposals prior to submitting formal comments. We believe that the time has come for the City to provide its perspective on WQARF funding for consideration by your subcommittee and the Groundwater Task Force.

1. The City of Glendale supports the Cities' Liability Proposal

Rationale: Under the Alternative Proposal offered by the Business Community, the RP (polluter) is required to only pay for the cleanup of contamination contained within the limits their property. Pollution originating from a source on the RP's property that migrates off-site will be classified as an orphan site. The responsibility to cleanup an orphan site rests with the State. The State through its taxing and revenue generating authority would assess entities not responsible for site contamination to pay for the cleanup of the orphan site.

The Cities' Proposal requires the RP to pay for the cleanup of contaminated sites originating from their management decisions, operational practices, and other activities, past and present. Water providers and the general public should not be required pay for the remediation of a site in which real RPs have been identified.

2. The first source of new revenue should be taxes on certain chemical products

Rationale: Taxes imposed on chemical products normally associated with site contamination should be considered prior to other revenue sources. The placing of a tax on the purchase of those chemicals will make the users of the product pay something close to the real cost of using the product. This may make the use of a substitute (less toxic) chemical product more attractive to consumers.

3. Glendale would prefer the establishment of a state sales tax component for WQARF over increasing the rates of the Municipal Water Users Tax and Solid Waste Fee

Rationale: The amounts of both municipal water used and solid waste disposed of at landfills will continue to grow due to urbanization. The total dollar amount generated from these two sources will, as a result, continue to grow without an increase in the tax rate. Moreover, the percent contribution by both funds is expected grow disproportionately large (as measured by percentage share). When originally implemented in 1986 the municipal water use tax contributed approximately 20% of the WQARF revenues. The tax currently accounts for over 30% of the fund.

The relationship between groundwater use and total municipal water use has changed considerably. Municipal water providers are relying more and more on non-groundwater resources to meet normal municipal water demand. Glendale's reliance on groundwater has declined from 100% in 1979 to approximately 30% in 1996. Contrary to popular belief, the WQARF tax based on total water use is largely taxing the use of non-groundwater water sources.

Currently operating Municipal Solid Waste Landfills are required to meet strict RCRA Subtitle D requirements which establishes standards for design, location, operation, closure and post-closure care. These standards include on-going groundwater monitoring and the demonstration of financial capability to properly care for a closed landfill for 30 years after closure. It is unlikely that currently operating Municipal SWLs will cause future WQARF contamination. In the event that such contamination occurs, the owner/operator will have the financial capability of remediating the contamination. Increasing the landfill tipping fee to pay for WQARF cleanups causes the landfill owner/operator to pay twice for site contamination liability.

Thank you for the opportunity to provide meaningful input into the process. Please feel free to contact me at 930-2254 or Doug Kukino at 930-2581 with any questions.

Sincerely,



Ken Martin

Deputy City Manager for Public Works

MEMORANDUM

TO: Members of the Groundwater Cleanup Task Force

FROM: Stephen J. Burg, City of Mesa
James R. Cairns, City of Chandler
Karen S. Gaylord, City of Tempe
Barbara Goldberg, City of Scottsdale
Karen L. O'Regan, City of Phoenix
Sandra E. Price, Sacks, Tierney & Kasen, P.A.
Christopher D. Thomas, Squire, Sanders & Dempsey
Christine Zielonka, City of Mesa

DATE: October 3, 1996

RE: WQARF Reform

The Cities of Mesa, Chandler, Phoenix, Scottsdale, Tempe and Tucson appreciate your additional comments upon our proposed revisions to the Water Quality Assurance Revolving Fund ("WQARF") program. Your comments conveyed one basic message: any proposals to amend WQARF must follow the mandates of HB 2114 and produce a workable program that requires all responsible parties to bear a fair share of the costs to remediate their historic contamination. We believe our modified proposal provides what the Legislature asked for in 2114 and what the Task Force recently requested anew: a WQARF program that is fair, workable, and financially practicable.

The primary elements of this proposal remain:

1. The permanent elimination of joint liability for all parties and the establishment of a liability scheme that limits responsible parties to fair share contribution;
2. Relief from liability for small businesses and individuals that commit to future compliance; and
3. An equitable and streamlined allocation system which encourages settlements and discourages litigation.

The other elements of the proposal include:

1. Improved information gathering authority for the Arizona Department of Environmental Quality ("ADEQ"), in order to ensure a fair allocation process;
2. Relief for treatment system and conveyance system operators which agree to accept treated water to facilitate WQARF remedies;

3. A system for limited reimbursement for costs of emergency response activities incurred by political subdivisions, along with a technical correction concerning individual liability for responding police officers and firefighters; and
4. A clarification that state and local governments should not be held liable when acquiring property solely for roadway expansion or utility installation.

Gone are the provisions which distracted the Task Force from the real debate: whether all of us should fairly share the burden of cleaning up pollution, wherever found, that we caused in the past. The multi-party landfill provisions of our original proposal have been eliminated. Likewise eliminated were proposals providing broader relief to operators of publicly owned treatment works and to governments in the acquisition of real property. In short, the proposal calls for equal treatment of those whose actions have contributed to contamination and have the resources to help with the solution. For your convenience, attached are redlined and "clean" versions of our specific proposals.

Under the "proportionate share" liability proposal, certain ADWR costs and most of ADEQ's community involvement costs should be recoverable from responsible parties, except for orphan shares. ADEQ should lower these estimates to account only for "orphan" share liability (e.g., reduce such costs by 75% using ADEQ's estimated orphan share percentage for landfill sites).

1000 lbs. 1000 lbs. 1000 lbs.
5000 lbs. 1000 lbs. 1000 lbs.
1000 lbs. 1000 lbs. 1000 lbs.

- Need to either tax
Supplier or dry cleaner. - Not Both

Dry cleaner will pay
the suppliers fees

- Need to tax all solvents
Used to clean clothes

Perc
Petroleum
Soaps - Plus -
Spotting CHEMICALS / Agents

(This will change competitiveness
of dry cleaners if it isn't done)

- Suggest increasing
Supplier fee to meet needs -
and eliminate dry cleaner fee.

- Calculate on gallon basis ← (could be
double checked)
Not lbs.

**FINAL
RECOMMENDATIONS
OF THE
REMEDY SELECTION SUBCOMMITTEE
AS APPROVED BY THE
GROUNDWATER CLEANUP TASK FORCE**

The Groundwater Cleanup Task Force shall:

1. Direct ADEQ to develop a remedy selection rule package that embodies the following guiding principle:

The remedy selection process shall ensure the selection of a remedy that meets the needs of the statutory requirements. The Remedy Selection Subcommittee does not recommend any changes to the statutory criteria for remedial requirements or remedy selection. The ADEQ remedy selection rules package shall include rules to identify the objectives of remedial actions, consistent with the statutory requirements and considering the criteria in A.R.S. 49-282.D and E.

2. Direct ADEQ to incorporate into the remedy selection rule package the remedy selection criteria and list of remedial alternatives described in Attachment 1. In developing a comprehensive approach for a particular site, more aggressive remedial alternatives in Attachment 1 (higher on the list) will often incorporate elements of less aggressive alternatives. For example, physical containment will likely include source control and monitoring.
3. Direct ADEQ to structure the remedy selection process in accordance with the methodology outlined below. This methodology consists of five steps:
 - a. **Characterize the site.** Site characterization shall be sufficient to establish the nature and extent of the contaminated groundwater and the sources thereof, as well as identify possible current and future impacts to human health and welfare, the environment, and beneficial uses of groundwater. To provide a basis for establishing remedial objectives, standardized plume characterization and contaminant and source characterization measurements such as those drafted in Attachment 2 should be determined.
 - b. **Set remedial objectives.** Based on site characterization information and in conjunction with a stakeholder/public participation process, remedial objectives for the site shall be developed.
 - c. **Develop a reference alternative.** Identify alternatives which are capable of achieving remedial objectives and develop a reference alternative which is based on best professional judgement after analysis of the four selection criteria—practicability, risk, cost, and benefit—and consideration of available remedial technologies. The reference alternative could be the most aggressive of the remedial alternative listed in Attachment 1 but typically should not be the least aggressive. The reference

alternative needs to be developed in sufficient detail to confidently forecast the cost and effectiveness of the remedy; plans at construction level detail are not required.

- d. **Develop alternatives to the reference alternative.** At a minimum, at least one more aggressive and one less aggressive alternative must be developed for comparison to the reference alternative. Although more aggressive alternatives can be analyzed within the same remedial alternative category as listed in Attachment 1, at least one alternative must be analyzed from a more aggressive remedial alternative category (higher on the list). The alternatives may utilize other viable technologies or more/less intensive use of the same technology. For each alternative, the standardized remedial efficiency and cost efficiency measurements such as those drafted in Attachment 2 should be determined.
 - e. **Select a preferred alternative.** The preferred alternative should be based on a weighing of the selection criteria set forth in Attachment 1 and the standardized remedial efficiency and cost efficiency measurements such as those listed in Attachment 2. The Preferred Alternative shall include a proposed timeline for implementation. Public participation shall be incorporated into the remedial design selection process.
- 4. Direct ADEQ to incorporate incentives for initiating early interim actions into the remedy selection rules.
 - 5. Direct ADEQ to incorporate provisions for voluntary remedial actions into the remedy selection rules.
 - 6. Direct ADEQ to require that source control be considered as an element of all remedial alternatives, if applicable, except for the monitoring and no action alternatives.
 - 7. Direct ADEQ to encourage consideration of innovative technologies as part of the reference design and remedial alternatives development process. If the selected remedy relies on innovative technologies, contingency provisions including appropriate relief from penalties shall be developed to address the possibility that the innovative technology does not have the desired beneficial effect.
 - 8. Direct ADEQ to require that a remedial action shall, at a minimum, address any well that currently supplies water for municipal, domestic, industrial, irrigation, or agricultural uses, or that is currently part of a public water system, if the well would, now or in the reasonably foreseeable future, produce water that would not be fit for its current or its reasonably foreseeable end uses without treatment due to the release of hazardous substances. The selection of the specific measures to address such well(s) shall be consistent with the remedy selection process described herein and shall not reduce the supply of water available to the owner of such well(s).

9. Direct ADEQ to develop rules to provide that once an interim or final remedy is approved by ADEQ, the method of addressing such well(s) identified in Paragraph 8 is given appropriate funding.

Attachment 1: Groundwater Cleanup Remedy Selection

Selection Criteria

Practicability: Practicability refers to the feasibility, short- and long-term effectiveness, and reliability of a particular remedial action alternative. The practicability of a remedial alternative can be influenced by criteria such as site-specific conditions, the chemical properties and physical distribution of contaminants, the performance capabilities of available technologies, and institutional considerations.

Risk: Risk refers to the evaluation of the remedial alternatives to determine their overall protectiveness of human health and aquatic and terrestrial biota under reasonably foreseeable land use scenarios and end uses of groundwater. Issues to be considered in the risk evaluation include, but are not limited to:

- fate and transport of contaminants, and concentrations and toxicity over the life of the remediation
- present and future land and resource use
- exposure pathways, duration of exposure, and changes in risk over the life of the remediation
- protection of human health and aquatic and terrestrial biota while implementing the remedial action
- residual risk in aquifer at end of remediation

Cost: Cost refers to the expenses and losses associated with a remedial alternative. The cost analysis considers capital, operating, maintenance, and life cycle costs. The cost analysis may include:

- analysis of uncertainties that may impact the cost of a remedial alternative
- analysis of projected groundwater uses and costs associated with use-based treatment
- resource impairment cost of groundwater not remediated to ambient water quality
- cost of alternative water supply or wellhead treatment

Benefit: Benefit refers to the value of the remediation. The benefits analysis considers factors such as lowered risk to humans and aquatic and terrestrial biota; reduced concentration and/or volume of contaminated water; decreased liability; acceptance by the public; esthetics; preservation of existing uses; enhancement of future uses; and improvements to local economies (such as elimination of brownfields).

Remedial Alternatives

Plume remediation: Plume remediation means achieving appropriate water quality standards for groundwater throughout the affected area. Source control and monitoring will likely be essential elements of this strategy.

Physical containment: Physical containment refers to an approach that attempts to contain contaminants within definite boundaries. In addition to monitoring and source control, this strategy may consist of coordination and control of groundwater pumpage and recharge to the extent that contamination is confined within a defined area. Source control and monitoring are also likely elements of this strategy. This strategy may require extensive groundwater management to implement.

Controlled migration: This strategy aims to control but not necessarily contain migration of contaminants. Source control and monitoring are likely elements of this strategy. Control of contaminants can potentially include the following components:

- control and/or coordination of pumpage that affects contaminant migration
- control and/or coordination of recharge that affects contaminant migration
- any other measures taken to control contaminant migration

This strategy could be used in conjunction with exposure management, thus minimizing risk associated with contaminant migration.

Source control: This strategy employs source control to ensure that contamination does not worsen due to uncontrolled contaminant releases. Monitoring is a likely component of this strategy. Source control can include, but is not limited to, mitigation of sorbed or free phase contaminants, pumpage of groundwater to contain or control significant sources of contaminants, and cleanup or removal of other continuing sources.

Monitoring: This strategy comprises monitoring of sites, including water quality and water level monitoring. This strategy does not incorporate elements of higher-level alternatives. Components of this strategy may include computer models to predict contaminant movement and contingency plans with appropriate action levels.

No action: This alternative consists of no action at a site. The site is not monitored nor are any remedial actions performed. This strategy is normally included as a baseline condition for comparison purposes but may be a viable alternative in limited cases.

Attachment 2: Proposed Standard Measurements for Comparison of Remedial Alternatives

Plume Characterization	<u>Typical Units</u>
Length	feet
Width	feet
Depth (thickness)	feet
Areal extent	acres
Volume	acre-feet
Plume leading edge advancement rate	feet/year
Plume volume expansion rate	acre-feet/year
 Contaminant and Source Characterization	
Probable contributing sources	[number]
Number of contaminants	[number]
Maximum concentration of each contaminant	µg/l
Contaminant concentration vs. MCL	ratio
Contaminant mass in plume	pounds
Weighted average contaminant concentration in plume	µg/l
If present, estimated mass of LNAPL	pounds
If present, estimated mass of DNAPL	pounds
Sorbed contaminant mass in plume	pounds
Rate of downgradient contaminant mass transport	pounds/year
 Remedial Efficiency	
Contaminant mass naturally degraded	pounds/year
Contaminant mass removed through remediation	pounds/year
Groundwater removed through remediation	acre-feet/year
Groundwater added (injected) by remediation	acre-feet/year
Net groundwater removed/added	acre-feet/year
Groundwater removed per year vs. plume volume expansion per year	percentage
Contaminant mass removed per year vs. preremedial contaminant mass transported downgradient per year	percentage
Time per first log cycle decline in average concentration	years per log cycle decline
 Cost Efficiency	
Contaminant mass removal	\$ per pound
Groundwater removal	\$ per acre-foot
Cost per first log cycle decline in average concentration	\$ per log cycle decline

Note: The measurements listed above are intended as draft only and may be modified upon further study and stakeholder input.

10/09/96

BIOREM

Bioremediation, Inc.
1881 West Prince Road, Tucson, Arizona 85705
(520) 887-9018

Dr. Herman Bouwer
U.S. Water Conservation Laboratory
4331 E. Broadway Road
Phoenix, Arizona 85040-8832

Date: September 30, 1996

Dear Herman :

I received a copy of your letter of September 25, 1996, on alternative approaches toward handling groundwater contamination situations in Arizona. The letter generated a few thought which I would like to share with you.

1. I agree that groundwater overdraft is not sustainable and must be eliminated by reducing groundwater pumping, as stated in the Arizona Groundwater Management Act of 1980.

2. Regarding contaminated plumes :

Contaminated plumes from point sources come in a broad range of sizes and characteristics. Most of them can be cleaned up. A controlled, ecologically based, aerobic, biological process can most likely restore the quality of the vadose zone and groundwater in most cases.

Some groundwater plumes which present special problems and cannot be restored by any of the methods available today, will have to be managed and the contaminant will have to be contained. Pump and treat is a suitable method for this kind of situation.

Management of a contaminated plume by the pump and treat technology should be the exception and not the rule.

3. The practical experience of the last decade indicates that pump-and-treat and vapor extraction, the most widely used physical means of remedial treatment, are not as effective as expected (See Science, Vol.250, No. 4982, Nov.9, 1990)

4. The approach to groundwater remediation situations expressed in your letter is based exclusively on physical principles, ignoring microbiological processes.

5. From our experience and this of others that work in the field, it is known that active bacterial communities capable of decomposing various contaminants are prevalent in the vadose zone and in groundwater. Electron micrographs have documented the presence of diverse bacterial populations, capable to live in contaminated environments. These bacteria were capable to degrade a variety of chemical compounds.

6. Our field experiences show that remedial biological treatments based on ecological principles and requirements, are effective in the removal of various contaminants "in situ" in soil and ground water.

7. Regarding non-point source pollution of groundwater in agricultural areas: no much data are available, but a number of cases cited in the literature have been successful in removing nitrates from groundwater. In areas where the potential for nitrates and pesticides contamination is high, preventive biological treatments can be installed to contain the spread of contamination.

8. Controlled biological processes are, more effective and less costly than the physical processes used today. The duration of a biological remedial treatment is comparatively shorter than most physical treatments.

Herman, my best wishes to you,


Netty Byras

copy: Christopher D. Thomas.



United States
Department of
Agriculture

Agricultural
Research
Service

Pacific West Area

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E-mail: hbouwer@uswcl.ars.ag.gov

September 30, 1996

FAX TRANSMISSION

Page 1 of 2

SUBJECT: Groundwater Contamination in Arizona (Improved Version)

TO: Chris Thomas 253-8129
Tom Suriano 244-5322
Chuck Graf 207-4674
Mason Bolitho 417-2401

FROM: Herman Bouwer

Here are some thoughts on alternative approaches toward handling groundwater contamination situations in Arizona, based on the following facts:

- a. Groundwater overdraft is not sustainable and must be eliminated by reducing groundwater pumping (Arizona Groundwater Management Act 1980).
- b. Complete clean-up of contamination plumes from point sources is essentially impossible because of stratification, diffusion, and free product.
- c. Serious non-point source pollution (salts, nitrates, and possibly pesticides) of upper groundwater and rising groundwater levels can be expected in agricultural areas which traditionally were irrigated with local groundwater but now use CAP water.
- d. There is a surplus of CAP water and full use of Arizona's entitlement will not occur until after about 2020. Recharge of groundwater, either directly or in-lieu, is encouraged to store or "bank" surplus CAP water for future use.

In view of these facts, the best approach to groundwater remediation situations may well be:

- a. Plume management to stop pollution at the source and to prevent its spread. The latter can be achieved by strategic pumping of groundwater from the plume and treating it for its intended use. Active clean-up would be restricted to hot spots.

b. Rather than trying to restore aquifers to drinking water quality or other remediation, entities affected by pollution plumes and needing the water would get CAP water, delivered to their municipal water treatment plant directly or via exchanges. This would be an extension of the in-lieu recharge concept. It could be financed jointly by the state, municipality, responsible parties, etc. The success rate of this approach would be far greater than that of remediation projects, which may become financial black holes. Where there are legal or institutional obstacles to this approach, such obstacles should be removed. Perhaps a special "plume pool" of CAP water could be created for this purpose. If groundwater pumping is to be reduced, the logical places to start are where groundwater already is so bad that it cannot be used as such anyway.

c. In rural areas irrigated with CAP water, upper groundwater eventually will become undrinkable. CAP water may then also be required to meet potable needs.

The challenge is to achieve the best cost effective solution.

RELIEF FOR SMALL BUSINESSES AND INDIVIDUALS

Background: Because it casts a wide liability net and because costs of remediation are frequently so high, many small businesses and individuals have faced the threat of overwhelming WQARF liability. Among other things, HB 2114 requires the court, when conducting equitable allocation, to consider the financial condition of such persons and businesses. While laudable, this amendment did not fully address the other problem small businesses and individuals commonly face under WQARF: the need to incur substantial transaction costs as a result of enforcement threats or private-party litigation. In the case of businesses with limited resources, from a societal perspective it makes little sense to require such businesses to incur these transaction costs, if ultimately they will be unable to contribute significantly to remediation. Furthermore, the Arizona Department of Environmental Quality ("ADEQ") frequently expends disproportionate resources in dealing with such parties. However, to avoid creating incentives for continued poor hazardous substance handling practices, such entities must remain liable for any criminal conduct and for prospective compliance with all environmental laws and regulations, and should be prohibited from enjoying this civil liability exemption if they have not otherwise cooperated with ADEQ.

Proposal: *A.R.S. § 49-283 should be amended to provide a defense with respect to releases or threats of release of hazardous substances which occurred prior to the effective date of this amendment to WQARF to a business or individual which can demonstrate by a preponderance of the evidence that:*

- 1. Its gross revenue, as reported to the United States Internal Revenue Service, for the preceding two years was \$2 million per year or less;*
- 2. It has agreed in writing to provide reasonable access to its facility to ADEQ, the U.S. Environmental Protection Agency, or other potentially responsible parties for the purposes of remedial investigation or remedy implementation;*
- 3. It has agreed in writing to provide reasonable access to its employees and former employees and relevant documents for the purposes of site investigation;*
- 4. It has fully complied with all requests for information regarding the site pursuant to Section 104(e) of CERCLA, 42 U.S.C. § 9604(e) or A.R.S. § 49-288;*
- 5. It has agreed in writing to obtain and provide to ADEQ a proper environmental compliance audit of its facility; and*

6. *It is not affiliated with any other party liable for response costs at the facility through any direct or indirect familial, corporate, or financial relationship, other than a contract for the treatment or disposal of a hazardous substance and has not divested itself of assets for the purpose of qualifying for this exemption.*

MULTI-PARTY LANDFILL LIABILITY

Background: ~~Multi party landfill sites present unique liability allocation problems, particularly as to waste activities prior to November 19, 1980, the effective date of record keeping regulations under Subtitle C of the Resource Conservation and Recovery Act ("RCRA"). (See 40 C.F.R. § 265.73; 45 Fed. Reg. 33232 (May 19, 1980). These sites, which are an allocation nightmare, entangle a broad mix of businesses, local governments, state agencies, large and small industries and residents.~~

~~Allocation at such sites frequently is largely dependent upon oral testimony and other anecdotal evidence. The absence of documentary evidence commonly precludes parties from reaching a non litigation resolution of liability. Furthermore, when liability at such sites is addressed in litigation, notwithstanding extensive and expensive discovery the parties and court may ultimately learn only that a variety of parties, during some period of time, sent an unquantifiable volume of hazardous substances to the site. In short, pre-RCRA landfills tend to generate relatively higher transaction costs and produce allocation outcome that many parties claim to be unfair. Providing for remediation of these sites through means other than the WQARF liability scheme would be an effective means of reducing transaction costs and addressing this problem.~~

~~Providing relief for landfills which closed prior to 1994 (which is the date of relevant amendments to RCRA Subtitle D), ensures that: (1) landfills currently operating will not be allowed to relax their stringent operating requirements; and (2) landfills closed prior to 1994, which are in "nowhere land" with respect to regulatory requirements, can be productively redeveloped.~~

Proposal: ~~WQARF should be amended to provide an 85 percent refund from the WQARF for parties undertaking appropriate response actions pertaining to multi party landfill sites at which disposal of hazardous substances first occurred prior to November 19, 1980, which were not subsequently granted permits to accept disposal of RCRA hazardous waste, and which did not receive any waste after October, 1993. This funding reimbursement should eliminate the need for working parties at such sites to conduct litigation. To qualify for this funding, a party must demonstrate by a preponderance of the evidence that: (1) the site was operated as a public solid waste landfill within the meaning of A.R.S. § 49-701, as a public service or for a fee, pursuant to a permit of a regulatory authority; (2) use of the landfill was not restricted to waste generated by a single entity and its affiliates or waste generated at a single facility or related facilities; and (3) the party informed the Arizona Department of Environmental Quality of the existence of the site and the general nature of any hazardous substances disposed of at the site within one hundred eighty (180) days of the effective date of this amendment to WQARF~~

~~or of discovery of the site, whichever is later. Reimbursement would be available only for costs incurred (in substantial compliance with A.R.S. § 49-282.02) subsequent to the effective date of this WQARF amendment. Parties seeking such reimbursement would be required to notify ADEQ of their intention to proceed under this provision, and receive ADEQ approval. ADEQ would remain responsible for oversight and issuance of a site Letter of Determination regarding such landfills. Reimbursement would be available only for necessary components of the remedial action and not for other redevelopment expenses. Future use would merely be taken into account in selecting the remedy in the same manner it is currently. At many sites, the remedy components likely would be: (1) a cap that complies with Subtitle D or Subtitle C design criteria; (2) a methane and other soil gas collection system; (3) if necessary, flood protection; and (4) if necessary, a groundwater monitoring and treatment system.~~

STATE LAW CONSISTENCY/DISPUTE RESOLUTION

STREAMLINED ALLOCATION SYSTEM

Background: Because of the complexity of issues and difficulty in obtaining relevant evidence, cost-recovery litigation has proven to be an ineffective means of resolving disputes about relative shares of cleanup liability under both the federal Superfund program, the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), and the state Superfund program, the Water Quality Assurance Revolving Fund ("WQARF"). While the Arizona Legislature has taken steps to streamline the WQARF cost-recovery process and achieve results that have greater substantive fairness (for instance, tentatively eliminating joint liability), two major problems remain. First, the incentive for public and private parties to conduct litigation under CERCLA must be removed, by providing in WQARF a preferable means of dispute resolution, including funding for orphan shares. Second, the WQARF dispute resolution process must be further refined to reduce the transaction costs generated by it. Merely weakening the liability provisions of WQARF will not resolve these problems, because that will generate additional litigation and enforcement under CERCLA by the U.S. Environmental Protection Agency and other parties which have incurred costs of response. At least with respect to private parties, it would be unconstitutional to pre-empt CERCLA's rights of cost recovery. The answer thus lies in making WQARF a preferred vehicle for both plaintiffs and defendants, public and private. Additionally, to the extent that the WQARF remedy selection process is more realistic and cost-effective, it benefits all concerned parties for allocation disputes, where they exist, to be resolved under WQARF. Among other things, to achieve this the WQARF statute must further discourage parties from declining to participate in conducting and funding necessary response activities.

Proposal: ***First, WQARF should be amended to permanently eliminate joint liability. Second, WQARF should be amended to provide a mandatory, non-binding fair share allocation process for all sites where two or more parties are alleged to be potentially responsible parties ("PRPs"). This allocation should be conducted by a neutral, third-party allocator, applying the allocation factors of A.R.S. § 49-285(F). The Allocator shall: (1) identify individual, identifiable Responsible Parties that are orphans because they can no longer be located, no longer exist, or are financially non-viable; (2) determine which potentially Responsible Parties are in fact liable; and (3) identify equitable shares of liability for Responsible Parties. The allocated shares must total 100%. Prior to completion of the allocation proceeding, no party (including the State of Arizona) should be allowed to initiate cost recovery or contribution litigation under WQARF with respect to the site.***

Necessary Information: ~~The allocation process shall begin as soon as practicable after development of sufficient information regarding the necessary site remedy and the identity of the PRPs ADEQ and noticed PRPs have had a reasonable time to conduct site remedy investigations, identify other PRPs, and pursue meaningful settlement discussions.~~

Allocation Process: ~~Before seeking judicial relief under WQARF, the Director or any Allocation under this provision may be sought by the Director or by a private party which has incurred costs of response shall undertake allocation as described herein. A private party may petition the Director to initiate allocation. The process shall be initiated by the Director's issuance of notice letters proposing an allocation scheme and estimating necessary site costs. The party seeking to initiate allocation shall provide written notification of potential liability to all known PRPs and to the Director. Following receipt of such notice, the notified PRPs shall have sixty days to, within a reasonable time, propose to the Director that additional PRPs be included in the allocation process. A party may not assert in any subsequent proceeding that another PRP is a non-party at fault if the party fails to identify the PRP, unless its identity could not be ascertained with reasonable diligence. Notice letters shall include a description of the proposed site remedy, an estimate of its cost, and a proposed allocation framework.~~

Immediate Settlement Discount: A PRP noticed by ADEQ may, at any time prior to selection of the allocator, resolve its liability by paying or arranging to pay 80 percent of its allocated percentage of liability.

Form of Settlement/Remedy Challenges: At the PRP's option, the settlement may be embodied as either a sum certain or a percentage of actual future costs. A PRP who settles for a percentage share of future costs may reserve the right to challenge the remedy selected or the costs incurred or both in the superior court upon completion of the allocation process.

Selection of Allocator: The neutral allocator shall be selected by consensus of the parties to the allocation process, from (a) a list of neutral parties maintained by the Director or (b) a list of neutrals maintained by the American Arbitration Association or an organization of comparable standing. If the parties are unable to agree on an allocator, one shall be appointed by the presiding civil judge of the Superior Court of Maricopa County.

Allocation Determination: At his discretion, considering the preference of the parties, the allocator shall conduct a mediation or arbitration process, culminating in the issuance of a written report which contains a non-binding equitable allocation of percentage shares of responsibility for response actions at the facility. The allocator's report shall specify the equitable share of each party present in the allocation, each absent party and each "orphan." ~~If appropriate, the proceeding shall otherwise be conducted in accordance with the Uniform Rules of Procedure for Arbitration for the Superior Court.~~

The allocator shall endeavor to complete the allocation process within six (6) months. The cost of the allocator shall be paid by the liable PRPs and ADEQ, with each PRP and ADEQ paying an identical share.

Allocation Costs and Fees: Each PRP that was noticed by ADEQ and found not liable by the allocator shall recover from ADEQ its reasonable attorneys' fees and costs incurred in connection with the allocation process or mediation. ~~, unless ADEQ requests the Superior Court to determine the liability of the PRP because ADEQ disagrees with the finding of the allocator.~~ Such award shall be paid out of ADEQ's budgeted funds, not WQARF funds. Each PRP that was noticed by another PRP and found not liable by the allocator shall recover from the noticing PRP its reasonable attorneys' fees and costs incurred in connection with the allocation process or mediation. ~~, unless the noticing PRP requests the Superior Court to determine the liability of the PRP because it disagrees with the finding of the allocator.~~ In the event that a losing party seeks relief in Superior Court because it disagrees with the allocator, payment of the costs and fees shall be deferred.

Information Gathering: For the purpose of conducting the allocation proceeding, the allocator shall be entitled to invoke the information gathering authority of the Director provided in A.R.S. § 49-288. ~~Additionally, each party to an allocation proceeding may be required to produce for examination, consistent with the Arizona Rules of Civil Procedure, a maximum of three (3) witnesses. Absent leave of the allocator, the duration of examination of any single witness shall not exceed eight (8) hours by all parties, including the allocator. For good cause, the allocator may allow additional discovery.~~

Post-Allocation Settlements: The moratorium upon cost-recovery litigation shall continue for 90 days following the issuance of the allocator's report. During that time, the parties to the allocation shall attempt to settle, as a group or individually, bearing in mind the decision of the allocator. At his sole discretion, the Director may choose to settle make an allocation share offer of settlement with any party to the proceeding ~~in an amount equal to or greater than the allocated share. In such event, the fact that the~~. The offer of settlement may be for an amount less than the share fixed by the allocator, and may be either for a fixed percentage of the future costs or for a sum certain. In such event, where the offer of settlement amount equals the allocable share shall create a rebuttable presumption in any subsequent administrative or judicial proceeding that the settlement is fair, reasonable, and consistent with WQARF.

Inability to Reach Settlement: In the event that the allocation process does not allow a negotiated settlement of the liability of all parties to the process, beginning with the 91st day following issuance of the allocator's report litigation concerning the facility may be initiated in the Superior Court against any party which has not resolved or proposed to resolve its liability

pursuant to the allocation proceeding in a settlement with the Director providing for a covenant not to sue and contribution protection. The action shall be tried to the court.

Post-Allocation Litigation: *Where ADEQ or a private party plaintiff believes that the determination of the allocator as to:*

- (1) the allocated share of a Responsible Party,*
- (2) the liability of a PRP, or*
- (3) the non-viability of a PRP*

is inaccurate, ADEQ, through the Attorney General, or a private party plaintiff may file an action in Superior Court. The action shall be tried to the court.

Disincentive to Litigation: *In an action brought in Superior Court, the prevailing party shall collect reasonable attorneys' fees, expert witness fees, and costs. In order for the State to be deemed the prevailing party, the State must be awarded an amount equal to or greater than the share fixed by the allocator or offered by the State, plus 10 percent of that share. In order for a private party plaintiff to be deemed the prevailing party, it must be awarded an amount equal to or greater than the share fixed by the allocator or offered by the party. Awards paid by ADEQ pursuant to this provision shall be paid out of ADEQ's budgeted funds and not the WQARF.*

Burden of Proof: *In judicial proceedings initiated by the State, the burden of proving equitable allocation factors under A.R.S. § 49-285(E) shall rest with the defendant. In actions between private parties, the burden of proving equitable allocation shall rest with the non-working party with respect to (a) costs of response that an adverse party has actually expended and (b) costs of response an adverse party is legally obligated to incur in the future pursuant to a binding judicial consent decree or administrative consent agreement under CERCLA or WQARF with ADEQ or the U.S. Environmental Protection Agency.*

Extent of Liability: *Parties who have participated in the allocation process shall be liable in any judicial proceeding only for their equitable share of liability, based upon the apportionment factors of A.R.S. § 49-285(F).*

Judicial Allocation: *The Court may use its sound discretion in weighing the allocation factors of A.R.S. § 49-285(F).*

Cooperating Party Discount: *The Allocator and the Court, if judicial proceedings are conducted, shall reduce the equitable share of each Cooperating Party by five (5) percent or \$25,000, whichever is less. Amounts*

so reduced may but need not be assigned to a non-Cooperating Party. As used herein, a "Cooperating Party" means and includes a party which: (a) has agreed in writing to provide reasonable access to its site to ADEQ, U.S. EPA, or other potentially responsible parties for the purposes of remedial investigation or remedy implementation; (b) has participated in the non-binding allocation process; (c) has complied with all requests for information regarding the site pursuant to Section 104(e) of CERCLA, 42 U.S.C. 9604(e), or A.R.S. § 49-288; and (d) is not in default of any provisions of an order issued under Section 106 of CERCLA 42 U.S.C. § 9606, or A.R.S. § 49-287.

Penalty for Recalcitrants: Any party which has declined to participate in the allocation process, if determined to be a liable party in a subsequent judicial proceeding, shall be ordered by the court to pay to the State or a private party plaintiff the costs, expert witness fees, and reasonable attorneys' fees incurred in litigating against the recalcitrant party. In addition, the court shall assess, as a premium against the recalcitrant party, one or more of the following costs:

- (1) an amount equal to the State's or a private party plaintiff's costs, expert witness fees, and reasonable attorneys' fees;*
- (2) an amount equal to two times the State's or a private party plaintiff's costs, expert witness fees, and reasonable attorneys' fees;*
- (3) an amount equal to 30% of the recalcitrant party's allocated share as determined by the court;*
- (4) an amount equal to the recalcitrant party's allocated percentage share of the entire "orphan" share; or*
- (5) an amount equal to the entire "orphan" share.*

These costs and premiums shall not be awarded against any PRP that has filed an allocation share offer of settlement with ADEQ prior to the commencement of a lawsuit, unless the adjudicated share awarded by the court for that PRP is greater than the allocation share offer of settlement.

These costs shall not be awarded against the State if it has filed an allocation share offer of settlement with the PRP prior to the commencement of a lawsuit, unless the adjudicated share awarded by the superior court for that PRP is less than the allocation share offer of settlement.

Other Settlement Authority: Except as specifically provided herein, the Director shall retain his authority to enter into settlements that are fair, reasonable, and consistent with WQARF and/or CERCLA. A PRP may settle with ADEQ at any time. Any settlement is subject to public comment and, if

for contribution, court approval. If a settlement is reached, and the PRP is later allocated or adjudicated, whichever is later, a percentage share larger than the settlement amount, the difference is an orphan share.

STREAMLINED ALLOCATION SYSTEM

Background: Because of the complexity of issues and difficulty in obtaining relevant evidence, cost-recovery litigation has proven to be an ineffective means of resolving disputes about relative shares of cleanup liability under both the federal Superfund program, the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), and the state Superfund program, the Water Quality Assurance Revolving Fund ("WQARF"). While the Arizona Legislature has taken steps to streamline the WQARF cost-recovery process and achieve results that have greater substantive fairness (for instance, tentatively eliminating joint liability), two major problems remain. First, the incentive for public and private parties to conduct litigation under CERCLA must be removed, by providing in WQARF a preferable means of dispute resolution, including funding for orphan shares. Second, the WQARF dispute resolution process must be further refined to reduce the transaction costs generated by it. Merely weakening the liability provisions of WQARF will not resolve these problems, because that will generate additional litigation and enforcement under CERCLA by the U.S. Environmental Protection Agency and other parties which have incurred costs of response. At least with respect to private parties, it would be unconstitutional to pre-empt CERCLA's rights of cost recovery. The answer thus lies in making WQARF a preferred vehicle for both plaintiffs and defendants, public and private. Additionally, to the extent that the WQARF remedy selection process is more realistic and cost-effective, it benefits all concerned parties for allocation disputes, where they exist, to be resolved under WQARF. Among other things, to achieve this the WQARF statute must further discourage parties from declining to participate in conducting and funding necessary response activities.

Proposal: *First, WQARF should be amended to permanently eliminate joint liability. Second, WQARF should be amended to provide a mandatory, non-binding fair share allocation process for all sites where two or more parties are alleged to be potentially responsible parties ("PRPs"). This allocation should be conducted by a neutral, third-party allocator, applying the allocation factors of A.R.S. § 49-285(F). The Allocator shall: (1) identify individual, identifiable Responsible Parties that are orphans because they can no longer be located, no longer exist, or are financially non-viable; (2) determine which potentially Responsible Parties are in fact liable; and (3) identify equitable shares of liability for Responsible Parties. The allocated shares must total 100%. Prior to completion of the allocation proceeding, no party (including the State of Arizona) should be allowed to initiate cost recovery or contribution litigation under WQARF with respect to the site.*

Necessary Information: *The allocation process shall begin as soon as practicable after ADEQ and noticed PRPs have had a reasonable time to*

conduct site remedy investigations, identify other PRPs, and pursue meaningful settlement discussions.

Allocation Process: *Before seeking judicial relief under WQARF, the Director or any private party which has incurred costs of response shall undertake allocation as described herein. A private party may petition the Director to initiate allocation. The process shall be initiated by the Director's issuance of notice letters proposing an allocation scheme and estimating necessary site costs. Following receipt of such notice, the notified PRPs shall, within a reasonable time, propose to the Director that additional PRPs be included in the allocation process. A party may not assert in any subsequent proceeding that another PRP is a non-party at fault if the party fails to identify the PRP, unless its identity could not be ascertained with reasonable diligence. Notice letters shall include a description of the proposed site remedy, an estimate of its cost, and a proposed allocation framework.*

Immediate Settlement Discount: *A PRP noticed by ADEQ may, at any time prior to selection of the allocator, resolve its liability by paying or arranging to pay 80 percent of its allocated percentage of liability.*

Form of Settlement/Remedy Challenges: *At the PRP's option, the settlement may be embodied as either a sum certain or a percentage of actual future costs. A PRP who settles for a percentage share of future costs may reserve the right to challenge the remedy selected or the costs incurred or both in the superior court upon completion of the allocation process.*

Selection of Allocator: *The neutral allocator shall be selected by consensus of the parties to the allocation process, from (a) a list of neutral parties maintained by the Director or (b) a list of neutrals maintained by the American Arbitration Association or an organization of comparable standing. If the parties are unable to agree on an allocator, one shall be appointed by the presiding civil judge of the Superior Court of Maricopa County.*

Allocation Determination: *At his discretion, considering the preference of the parties, the allocator shall conduct a mediation or arbitration process, culminating in the issuance of a written report which contains a non-binding equitable allocation of percentage shares of responsibility for response actions at the facility. The allocator's report shall specify the equitable share of each party present in the allocation, each absent party and each "orphan." The allocator shall endeavor to complete the allocation process within six (6) months. The cost of the allocator shall be paid by the liable PRPs and ADEQ, with each PRP and ADEQ paying an identical share.*

Allocation Costs and Fees: *Each PRP that was noticed by ADEQ and found not liable by the allocator shall recover from ADEQ its reasonable attorneys' fees and costs incurred in connection with the allocation process or mediation. Such award shall be paid out of ADEQ's budgeted funds, not*

WQARF funds. Each PRP that was noticed by another PRP and found not liable by the allocator shall recover from the noticing PRP its reasonable attorneys' fees and costs incurred in connection with the allocation process or mediation. In the event that a losing party seeks relief in Superior Court because it disagrees with the allocator, payment of the costs and fees shall be deferred.

Information Gathering: For the purpose of conducting the allocation proceeding, the allocator shall be entitled to invoke the information gathering authority of the Director provided in A.R.S. § 49-288.

Post-Allocation Settlements: The moratorium upon cost-recovery litigation shall continue for 90 days following the issuance of the allocator's report. During that time, the parties to the allocation shall attempt to settle, as a group or individually, bearing in mind the decision of the allocator. At his sole discretion, the Director may make an allocation share offer of settlement with any party to the proceeding. The offer of settlement may be for an amount less than the share fixed by the allocator, and may be either for a fixed percentage of the future costs or for a sum certain. In such event, where the offer of settlement amount equals the allocable share shall create a rebuttable presumption in any subsequent administrative or judicial proceeding that the settlement is fair, reasonable, and consistent with WQARF.

Inability to Reach Settlement: In the event that the allocation process does not allow a negotiated settlement of the liability of all parties to the process, beginning with the 91st day following issuance of the allocator's report litigation concerning the facility may be initiated in the Superior Court against any party which has not resolved or proposed to resolve its liability pursuant to the allocation proceeding in a settlement with the Director providing for a covenant not to sue and contribution protection. The action shall be tried to the court.

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Burden of Proof: *In judicial proceedings initiated by the State, the burden of proving equitable allocation factors under A.R.S. § 49-285(E) shall rest with the defendant. In actions between private parties, the burden of proving equitable allocation shall rest with the non-working party with respect to (a) costs of response that an adverse party has actually expended and (b) costs of response an adverse party is legally obligated to incur in the future pursuant to a binding judicial consent decree or administrative consent agreement under CERCLA or WQARF with ADEQ or the U.S. Environmental Protection Agency.*

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Judicial Allocation: *The Court may use its sound discretion in weighing the allocation factors of A.R.S. § 49-285(F).*

Cooperating Party Discount: *The Allocator and the Court, if judicial proceedings are conducted, shall reduce the equitable share of each Cooperating Party by five (5) percent or \$25,000, whichever is less. Amounts so reduced may but need not be assigned to a non-Cooperating Party. As used herein, a "Cooperating Party" means and includes a party which: (a) has agreed in writing to provide reasonable access to its site to ADEQ, U.S. EPA, or other potentially responsible parties for the purposes of remedial investigation or remedy implementation; (b) has participated in the non-binding allocation process; (c) has complied with all requests for information regarding the site pursuant to Section 104(e) of CERCLA, 42 U.S.C. 9604(e), or A.R.S. § 49-288; and (d) is not in default of any provisions of an order issued under Section 106 of CERCLA 42 U.S.C. § 9606, or A.R.S. § 49-287.*

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shall assess, as a premium against the recalcitrant party, one or more of the following costs:

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Other Settlement Authority: Except as specifically provided herein, the Director shall retain his authority to enter into settlements that are fair, reasonable, and consistent with WQARF and/or CERCLA. A PRP may settle with ADEQ at any time. Any settlement is subject to public comment and, if for contribution, court approval. If a settlement is reached, and the PRP is later allocated or adjudicated, whichever is later, a percentage share larger than the settlement amount, the difference is an orphan share.

ENHANCED INFORMATION GATHERING AUTHORITY

Background: Much of the success of any WQARF reform will come as the result of a more effective and comprehensive gathering of information by ADEQ, particularly if the agency will be called upon to identify responsible parties and their respective shares of liability. While preserving much of A.R.S. § 49-288, including its essential due process protections, the proposed changes would put some "teeth" into the statute by clarifying and enhancing the authority currently provided to the Director. This would ensure that those who are not candid and straightforward in their responses to ADEQ do not enjoy a benefit as a result.

Proposal: A.R.S. § 49-288 should be amended as follows:

First, subsection (B) would be amended for sake of clarity to state that the Director of ADEQ or his designee may "require" (not, as currently written, "request to require"), after reasonable notice, the production of the following information, without limitation, pertaining to a release or threat of release of hazardous substances, pollutants or contaminants:

(a) the identification, nature and quantity of materials which have been or are generated, treated, stored or disposed of at a facility, or transported to a facility;

(b) the nature or extent of a release or threatened release of a hazardous substance at or from any facility;

(c) the ability of a person to pay for or undertake remedial actions under the statute.

The State could request only currently existing and readily available information in the possession or under the control of the potentially responsible party.

Second, judicial enforcement authority would be enhanced, to allow the court to enjoin interference or order compliance with any information gathering activity permitted under the statute. Moreover, the civil penalty which the court may impose for violation of an ADEQ order to provide information would be increased to \$25,000 for each day of noncompliance.

Information obtained would be presumed to be public information, unless the person required to provide the information satisfies the criteria set forth in A.R.S. § 49-205.

Finally, the statute would be amended to provide for sanctions for any perjurious or false statements as set forth in A.R.S. §§ 13-2701 et seq.

The amendment would not alter the current statutory provision that only currently available information can be requested.

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(a) the identification, nature and quantity of materials which have been or are generated, treated, stored or disposed of at a facility, or transported to a facility;

(b) the nature or extent of a release or threatened release of a hazardous substance at or from any facility;

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The amendment would not alter the current statutory provision that only currently available information can be requested.

POTW AND CONVEYANCE SYSTEM LIABILITY

Background: ~~In a handful of recent CERCLA cases elsewhere in the United States, publicly owned treatment works ("POTWs") have been found potentially liable under the federal Superfund statute because of the alleged leaking of hazardous substances disposed of by others from sewer pipes. POTWs provide a vital public service by accepting wastewater from residential, commercial, and industrial sources. This service is provided in accordance with and strictly regulated under federal and state law. In addition, POTWs and similar conveyance~~ Publicly owned treatment works ("POTWs") and conveyance systems such as irrigation canals commonly are called upon to accept discharge of remediated groundwater by ADEQ or responsible parties conducting CERCLA or WQARF remediation. POTWs and operators of such conveyance systems should not face WQARF liability because of their provision of these valuable services, provided they have operated their system in a responsible fashion. Shares of liability, if any, covered by this exception would become orphan shares. ~~Indirect dischargers of hazardous substances would remain protected by current A.R.S. § 49-283.D.4.~~

Proposal: *To complement other proposals by the End Use Subcommittee, A.R.S. § 49-283 should be amended to expressly provide a defense to WQARF liability to owners and operators of POTW systems and constructed water conveyance systems, as follows:*

As used in A.R.S. § 49-283.A, "the party responsible for the release or threatened release of a hazardous substance" does not include an owner or operator of a publicly owned sewer or publicly owned treatment works as defined in Section 212 of the Federal Water Pollution Control Act, 33 U.S.C. § 1292 or an owner or operator of a constructed water conveyance system, where such treatment works or conveyance system accepts treated wastewater pursuant to a WQARF Remedial Action Plan. The exclusion in this paragraph shall not apply when a release or threatened release of a hazardous substance from such sewer, treatment works, or conveyance system is caused by the gross negligence or intentional misconduct of the owner or operator.

CONVEYANCE SYSTEM LIABILITY

Background: Publicly owned treatment works ("POTWs") and conveyance systems such as irrigation canals commonly are called upon to accept discharge of remediated groundwater by ADEQ or responsible parties conducting CERCLA or WQARF remediation. POTWs and operators of such conveyance systems should not face WQARF liability because of their provision of these valuable services, provided they have operated their system in a responsible fashion. Shares of liability, if any, covered by this exception would become orphan shares.

Proposal: *To complement other proposals by the End Use Subcommittee, A.R.S. § 49-283 should be amended to expressly provide a defense to WQARF liability to owners and operators constructed water conveyance systems, as follows:*

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EMERGENCY RESPONSE LIABILITY

Background: This provision is a technical correction to the Statute. State and local governments are commonly called upon to respond to hazardous substance emergencies created by other persons. In order to protect state and local governments from incurring liability in connection with such emergency response actions, current A.R.S. § 49-283.G exempts such governments from WQARF liability except in cases of gross negligence or intentional misconduct. Unfortunately, the Section does not clarify which individuals fall within the definition of "state or local government" and hence qualify for the liability protection. For instance, municipal firefighters and police officers are not expressly covered by the liability exclusion, even when undertaking emergency response actions on behalf of their employer-government. Although there is another liability exclusion applicable to all persons undertaking non-emergency response activities (A.R.S. § 49-283.F), the liability exclusion under this provision is lost in the event of negligence (as opposed to "gross" negligence). The interplay of these two provisions creates the odd situation under which, for instance, a municipal police officer could be held liable for hazardous substance releases occurring during a raid on a methamphetamine lab, but his employer-government could not. Obviously, the same standard of liability should be applied to both governments and their employees and representatives in emergency response situations.

Proposal: *A.R.S. § 49-283.G should be amended to clarify that the liability exclusion applies not only to state and local governments responding to hazardous substance emergencies, but also to their employees and authorized representatives.*

EMERGENCY RESPONSE FUNDING

Background: Political subdivisions which provide emergency response to releases or threatened releases of hazardous substances caused by others face unreasonable delays in obtaining reimbursement for the costs of response. Section 123 of the Comprehensive Environmental Response, Compensation, and Liability Act allows political subdivisions to seek reimbursement (up to \$25,000) only in limited circumstances. Direct reimbursement to political subdivisions from the Water Quality Assurance Revolving Fund for costs not reimbursed under CERCLA would ensure and enhance the continued ability of political subdivisions to undertake emergency response actions.

Proposal: *A.R.S. § 49-282.02 should be amended to expressly provide for reimbursement from the Water Quality Assurance Revolving Fund of the reasonable emergency-response costs incurred by political subdivisions. Subsection (A) would be amended to permit not only the ADEQ Director, but also the appropriate representative of the responding political subdivision, to make the determination that an "emergency" exists or existed at the time the response costs were incurred. Political subdivisions must first seek reimbursement from the federal Superfund. Reimbursement will be available only for costs not reimbursed by the federal Superfund. Each political subdivision could seek reimbursement of no more than \$150,000 per year.*

OWNER LIABILITY CLARIFICATION

Background:

In the course of responding to a threat to the public health and welfare or in undertaking a proper public purpose, state and local governments frequently acquire title to property through the exercise of eminent domain or similar purchase. Current WQARF protections for state and local governments engaged in such activities do not adequately provide protection against unfair application of law. For instance, current A.R.S. § 49-283(G) protects state and local governments undertaking hazardous substance responses, but does not extend to actions taken by such governments in response to other public health and safety emergencies. Similarly, relegating state and local governments to demonstration of the WQARF third-party defense is not appropriate in circumstances where such governments acquire title to small real property parcels to construct public amenities such as widened roadways and utilities.

Proposal:

A.R.S. § 49-283 should be amended to expressly clarify that state and local governments shall not be held liable when their ties to a facility are the result of an emergency response or ~~the acquisition of title or interest for a public purpose within the meaning of A.R.S. § 12-1111 for purposes of roadway construction or utility installation.~~ The section would be amended as follows:

A unit of state or local government shall not be liable under this Section if it acquired ownership or interest in a facility through any of the following:

- 1. Escheat, bankruptcy, tax delinquency, abandonment or similar circumstance showing involuntary acquisition; or*
- 2. Eminent domain, purchase, or condemnation of, or related involvement with real property, ~~if necessary to accomplish a public purpose within the meaning of A.R.S. § 12-1111 necessary for purposes of roadway construction or utility installation,~~ or in response to a threat to public health or welfare.*

The state or local government must have acquired its ownership or interest after the original disposal of the hazardous substance on, in, or at the facility.

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In the course of responding to a threat to the public health and welfare or in undertaking a proper public purpose, state and local governments frequently acquire title to property through the exercise of eminent domain or similar purchase. Current WQARF protections for state and local governments engaged in such activities do not adequately provide protection against unfair application of law. For instance, current A.R.S. § 49-283(G) protects state and local governments undertaking hazardous substance responses, but does not extend to actions taken by such governments in response to other public health and safety emergencies. Similarly, relegating state and local governments to demonstration of the WQARF third-party defense is not appropriate in circumstances where such governments acquire title to small real property parcels to construct public amenities such as widened roadways and utilities.

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The state or local government must have acquired its ownership or interest after the original disposal of the hazardous substance on, in, or at the facility.

ALTERNATIVE WQARF REFORM CONCEPT PAPER

I. Liability

Principle: WQARF should contain a fair and equitable liability scheme that minimizes administrative and enforcement costs and maximizes the use of program expenditures for site remediation to the benefit of public health and the environment. As stated in the original Statement of Business Community Principles for Reforming the WQARF Program, business supports a proportionate share liability system where a responsible party would be required to pay only for remediation attributable to its own activities and not for contamination caused or contributed by other parties.

However, APS proposed an innovative alternative that has the potential to dramatically accelerate the remediation of contaminated groundwater and sources of contamination and to dramatically reduce transactional costs. The following alternative incorporates much of the APS proposal, with additional amendments that reflect some of the comments received to date from businesses and other stakeholders of the Groundwater Task Force. This document is a "draft" document that continues to be refined as the Task Force continues its discussions.

A. Source liability: Joint liability would be eliminated and a liability scheme based on a "bright-line" allocation of a party's responsible share of liability would be implemented as follows:

1. Responsible parties ("RP") would be required to pay for "source" remediation. Many businesses support ADEQ's recommendation that each RP pay for its proportionate share of the cost of the source investigation and remediation and a share of all "source" orphan shares, so there would be no orphan shares for source remediation.
2. "Source" contamination includes soil contamination and it can include groundwater contamination (*e.g.* DNAPLs). A technical definition of "source" groundwater contamination is necessary.
3. Non-source contamination (*e.g.*, non-DNAPL groundwater contamination) would be paid for through the WQARF funding mechanism described below provided the RP has "earned" WQARF funding by:
 - a. Entering into an agreement with ADEQ to cleanup "source" contamination.

- b. Providing reasonable access to the site and to employees for appropriate ADEQ remedial investigations.
 - 4. "Source" remediation liability would apply to all WQARF sites, regardless of when a release occurred. (See item 6 below for rationale).
 - 5. Equitable apportionment of "source" remediation liability would be determined based on the following allocation factors:
 - a. The relative amount, concentration and degree of toxicity of each hazardous substance released by the RP.
 - b. The degree of involvement by the RP in the generation, transportation, treatment, storage or disposal of the hazardous substance.
 - c. The RP's ability to continue in business after payment of its responsible share and whether the payment of that share would render the RP insolvent or require the RP to seek protection under federal bankruptcy law. Because of the significant tangible benefit of the APS proposal.
 - d. The magnitude of the risk to human health or the environment caused by each hazardous substance released by the responsible party.
 - e. The cooperation or the lack of cooperation of the RP with ADEQ's investigation of source and non-source contamination.
 - 6. RPs remain subject to the liability provisions of all applicable state laws governing environmental permits or regulatory requirements, other than WQARF, that may hold parties legally responsible for contamination. In addition, any financial assurance for remediation available under other applicable state environmental regulatory programs shall be applied to address non-source contamination prior to being eligible for WQARF funds.
- B. Preclusion: The state would be precluded from using CERCLA to the extent CERCLA is inconsistent with state law.
- 1. ADEQ may nevertheless use CERCLA as follows:

- a. Where ADEQ is designated as the lead agency at an NPL site.
 - b. Where ADEQ seeks to recover natural resource damages.
 - c. In a settlement where a RP requests a covenant not to sue and contribution protection.
 - d. When CERCLA is not inconsistent with the WQARF statute.
2. Regardless of the above, CERCLA may not be used simply to circumvent the WQARF directives.
- C. Investigation and Allocation Process: An investigation and allocation process to quickly determine a party's responsible share of "source" liability, would be implemented. The allocation process would have the following elements:
1. ADEQ and/or any party-in-interest would be authorized to conduct Preliminary Assessment and Site Investigations ("PA/SI"), Remedial Investigation and Feasibility Studies ("RI/FS") or any other appropriate phased investigations provided certain objectives and requirements are met. [Many businesses support ADEQ's proposal that would enable ADEQ to recover its costs against viable RPs for any "source" investigation and remediation, thereby preserving the WQARF fund for non-source remediation.]
 - a. ADEQ would be required to provide general or informal notice of ADEQ's intention to conduct a source PA/SI and/or RI/FS.
 - b. Any party-in-interest who so desires must be given the opportunity to comment on and participate in the source PA/SI and/or RI/FS. In addition, a party-in-interest may perform a source PA/SI and RI/FS with appropriate ADEQ oversight.
 - c. ADEQ would be authorized to request and obtain readily available, relevant information regarding a source.
 - (1) Relevant information would be defined as information regarding the type(s) and amount(s) of waste disposed of at a source.
 - d. ADEQ would be granted reasonable access to a source.

- e. ADEQ would be granted authority to seek an order compelling production of relevant, readily available information if a party refused to cooperate, although the sanctions available should be limited and reasonable.
 - f. Because an ADEQ-conducted source PA/SI and RI/FS could be funded through the WQARF funding mechanism, ADEQ would be required to conduct a thorough investigation that identifies, to the maximum extent reasonable, all potentially responsible parties ("PRPs"), including other potential source PRPs.
 - (1) Private parties may submit to ADEQ the names of additional PRPs, and ADEQ would be required to investigate such additional PRPs.
 - (2) Private parties submitting the names of additional PRPs also must submit to ADEQ any readily available, relevant information regarding that additional source PRP.
2. ADEQ would provide formal notice to PRPs after completion of the source PA/SI and RI/FS.
- a. Once formally notified, PRPs would be given a reasonable period of time to conduct their own investigations, evaluate whether to voluntarily agree to remediate the source of contamination, identify additional PRPs, and pursue meaningful settlement discussions with ADEQ.
3. In instances where multiple parties are responsible for cleanup, a mandatory non-binding allocation process would be conducted to allocate responsible shares of source contamination.
- a. Such an allocation process may commence only after the source PA/SI and RI/FS are completed and reasonable notice is provided to the PRPs.
 - b. When giving notice to PRPs, ADEQ must identify each PRP's proposed source liability allocated share of the remedial action cost, and specify the proposed remedial action activities and costs. All proposed remedial activities must be reasonable, necessary, cost effective and technically feasible as required by the WQARF statute.

- c. The PRPs will be provided a reasonable period of time to prepare for the allocation process.
 - (1) The time allowed before the allocation process commences must be flexible enough to allow adequate preparation by the PRPs, including conducting site investigations, pursuing settlement options, and identifying additional PRPs (which also must be given an adequate time to respond).

[NOTE: The following settlement incentives and detailed procedures to legally challenge the allocator's determination are provided as an alternative to the settlement discounts and legal procedures proposed by the Cities and the Attorney General's office for their "proportionate-share" liability scheme. However, such settlement incentives and detailed legal procedures would not be necessary, and the allocation process could be streamlined significantly under the "source" liability proposal. Consequently, the following procedures would apply only to a proportionate-share liability approach, and not to the APS source-liability approach.]

- d. Incentives should be developed to encourage early involvement by PRPs in remediating contamination or paying for their "proportionate share" of liability.
 - (1) At any time before the commencement of the allocation hearing, a PRP may resolve its liability by paying or agreeing to pay 70% of its several liability allocated share as determined by ADEQ. The 30% discount given to such a settling PRP would become an orphan share to be paid through the WQARF fund. **As previously stated, the discount referenced in this paragraph would not be necessary under the "source" liability proposal.**
 - (2) Additional incentives should be provided for a party-in-interest who performs a PA/SI, RI/FS and early remediation.
- e. Based on all of the information submitted by ADEQ and the PRPs, the mutually agreed upon allocator(s) shall determine which PRPs are in fact liable (and therefore are RPs) and which PRPs are orphans, and shall specify for each RP and the orphan share its

proportionate share of liability (the "allocated share"). The allocated shares must total 100%.

- (1) The allocator shall be entitled to invoke the information gathering authority provided in A.R.S. § 49-288. In addition, each party to the allocation may be subject to limited discovery in accordance with the Arizona Rules of Civil Procedure.
- (2) A RP that does not participate in the allocation process (a "Non-Participating RP") but seeks to settle with ADEQ after the allocation process is completed will be required to pay its allocated share plus a premium to compensate for its refusal to participate in the allocation process. **[In the source-liability proposal, the Non-Participating RP would be liable for its proportionate share of any non-source contamination.]**
- (3) Although the allocator's determination regarding the proportionate share of liability for each RP and the orphan share shall be subject to legal challenge by the filing of a legal action in Superior Court, no such action shall be filed until 90 days following issuance of the allocator's decision (to allow a period for settlement discussions) and the allocator's decision shall be given appropriate deference by the court reviewing the allocation.
- (4) If ADEQ disputes the allocator's determination regarding liability and/or allocation and declines to settle with any RP on the terms of the allocation, ADEQ may file an action in Superior Court. However, ADEQ shall bear the burden of proving by a preponderance of the evidence that the PRP is liable and that the allocated share was wrong. Unless the court determines that an RP is liable for a share that is (a) at least two times the allocated share if the allocated share is less than 5%, or (b) at least 5% higher than the allocated share if the allocated share is equal to or greater than 5%, ADEQ shall pay the RP its reasonable attorneys' fees, expert fees and costs for the Superior Court action out of the Attorney General's budgeted fund, not WQARF. The RP would pay the court-ordered share. **[As previously stated, the detailed legal procedures referenced in this**

paragraph would not be necessary under the "source" liability proposal.]

- (5) If a RP disputes the allocator's determination regarding liability and/or allocation and declines to settle with ADEQ on the terms of the allocation, the RP may file an action in Superior Court. However, the RP shall bear the burden of proving by a preponderance of the evidence that RP is not liable and that the allocated share was wrong with respect to that RP. Unless the court determines that the RP is liable for a share that is (a) at least one-half of the allocated share if the allocated share is less than 10% or (b) at least 5% less than the allocated share if the allocated share is greater than 10%, the RP shall pay ADEQ its reasonable attorneys' fees, expert fees and costs for the Superior Court action in addition to paying the court-ordered share. **[As previously stated, the detailed legal procedures referenced in this paragraph would not be necessary under the "source" liability proposal.]**
- (6) ADEQ may file an action in Superior Court against a Non-Participating RP that refuses to settle with ADEQ pursuant to the provision set forth above. In such an action, ADEQ shall bear the burden of proving by a preponderance of the evidence that the party is liable. The Non-Participating RP shall bear the burden of proving its proportionate share of liability. If ADEQ proves liability, the Non-Participating RP shall pay ADEQ its reasonable attorneys' fees, expert fees and costs for the Superior Court action, the court-ordered share, and a premium to compensate for its refusal to participate in the allocation process. **[In the source-liability proposal, the Non-Participating RP would be liable for its share of any non-source contamination.]**

II. **Funding**

Principle: In general, many businesses support the APS proposal. The elimination of joint liability and implementation of a "bright-line" liability scheme will require that a dedicated, long-term source of funding be provided to pay for remediation of non-source contamination. In addition, many businesses agree that any excess dollars remaining in the WQARF fund would remain in the fund and not revert to the general fund. If an Advisory Board determines in the future that funding is inadequate, business supports the

evaluation of additional funding alternatives rather than the reinstatement of joint liability.

- A. Direct Costs: Additional WQARF funding should be dedicated to pay for the direct costs of WQARF investigations and cleanups.
 - 1. Because legislative oversight is the most effective means of ensuring that the costs of administering the program are maintained at a reasonable level, program administrative costs (*i.e.*, indirect costs) should be separately funded through a process that provides appropriate legislative oversight or limitations.
- B. Funding Sources and Amount: The sources and amount of funding should be based upon identified sites. Funding for future sites should be addressed as those sites are identified and selected for cleanup based upon new risk-based site prioritization criteria being developed by the Task Force. A reasonable financing mechanism which is limited in duration to provide future review and evaluation should be utilized to fund the WQARF program.
 - 1. Funding sources should be evaluated based upon equity in relation to both those who will benefit from WQARF cleanups and those who are responsible for causing the problem, and should be evaluated based upon (i) efficiency of collection and administration and (ii) the potential effects of new or increased taxes and fees on the demand for goods and services that are taxed and on business competitiveness.
 - 2. In addition to existing funding sources, possible funding sources might include those sources referenced in the APS proposal (*i.e.*, a user fee charged on the purchase of select chemicals identified from the SARA 313 list, provided such chemicals either have been shown to be major contributors to groundwater contamination or potentially could cause groundwater contamination, a transaction fee on real estate transfers, and a waste disposal tipping fee). However, other potential funding sources from business also should be examined.
 - 3. The amount of funding provided should take into account anticipated cost savings achieved by a "bright-line" liability scheme and by more cost-effective and risk-based site prioritization and remedy selection criteria being developed by the Task Force.
 - 4. An estimated initial funding level should be established (*e.g.*, \$15 million per year), subject to reevaluation and appropriate adjustment on a periodic

basis (*e.g.*, every five years). Any adjustment in funding level would have to be justified based on ADEQ's prioritization of identified WQARF sites to be addressed over the next five years

III. Site Prioritization

Principle: Many businesses support the APS proposal with respect to site prioritization. In addition, many businesses believe the selection of sites for investigation and cleanup under the WQARF program should be based upon a system that more appropriately and accurately prioritizes the risks to public health and aquatic and terrestrial biota that are posed by each site.

- A. Only sites that pose unacceptable levels of demonstrable risk to public health or aquatic and terrestrial biota should be selected for cleanup under the WQARF program.
- B. Sites should be identified and their boundaries established based upon identified sources of contamination in lieu of many of the current arbitrary WQARF site boundaries.

IV. Remedy Selection

Principle: Many businesses support the APS proposal with respect to the issue of remedy selection. In addition, many businesses believe that remedy selection should be based upon a site-specific risk assessment system that leads to the selection of remedies that are protective of human health and aquatic and terrestrial biota at the point of exposure, that are technically feasible, cost effective and based on the current and reasonably anticipated future uses of land, water and other resources.

- A. Remedies must have realistic, identifiable and justified benefits to human health and aquatic and terrestrial biota that outweigh the economic costs.
- B. The remedy selection process should include the early institution of remedies that protect against actual exposure to hazardous substances that may be harmful to human health or aquatic and terrestrial biota. After implementing any necessary immediate actions to control actual exposure, other measures that meet the required response action criteria may be instituted to address other risk-based remedial objectives.

- C. Remedy selection should not automatically assume that a contaminated aquifer must be or can be cleaned to drinking water standards. The remedy selected should be site-specific and determined after an evaluation of all reasonable remedial alternatives using acceptable selection criteria (*e.g.*, practicability, risk, cost, and benefits of each alternative).

V. End Use for Remediated Water

Principle: Many businesses support the APS proposal with respect to end use. In addition, many businesses believe reforms should be instituted to encourage the use of water pumped as part of a remedial project.

- A. Existing obstacles that discourage or inhibit the use of remediated water (such as requirements for treatment that exceed the level of protection needed for the end use of the water and liability of water purveyors and other users accepting remediated water) should be reformed.
- B. Conflicts between the objectives of withdrawing water for remediation purposes and the objectives of the Groundwater Management Act should be resolved to remove disincentives for the beneficial use of remediated water.

VI. Well Design and Use

Principle: Many businesses support the APS proposal. In addition, many businesses believe as a means of instituting early remedies that protect against actual exposure to contaminated groundwater in WQARF areas and to reduce or prevent the spread of contamination in WQARF areas, additional controls on the design and use of wells within WQARF areas or that influence groundwater movement in those WQARF areas should be developed.

- A. WQARF reform should support (i) well construction standards that prevent cross contamination of aquifers and (ii) a process to identify and correct existing wells within designated WQARF sites that are shown to be causing cross contamination.

VII. Public Participation

Principle: Many businesses generally support the APS proposal regarding the implementation of public participation through a WQARF Advisory Board and Community Involvement Groups. In addition, many businesses believe any new public participation requirements under the WQARF program should take into account existing regulatory and programmatic provisions for public participation to avoid duplication and to coordinate all public participation activities.

VIII. Small Business Relief

Principle: Many businesses generally support the APS proposal regarding small business relief. In addition, many businesses believe small businesses should not be categorically excluded from several liability under WQARF. Many businesses support the implementation of the WQARF amendments made in HB 2114, which authorize ADEQ to consider a PRP's financial ability to pay.

IX. Emergency Response

Principle: WQARF funding should account for the need for responding to emergency situations. Many businesses support the APS proposal with respect to emergency response but believes that there should be a reasonable annual cap on a political subdivision's claim to the fund. Many businesses also support the Cities' proposal to extend the liability exclusion for state and local governments responding to hazardous substances emergencies to their employees and authorized representatives.

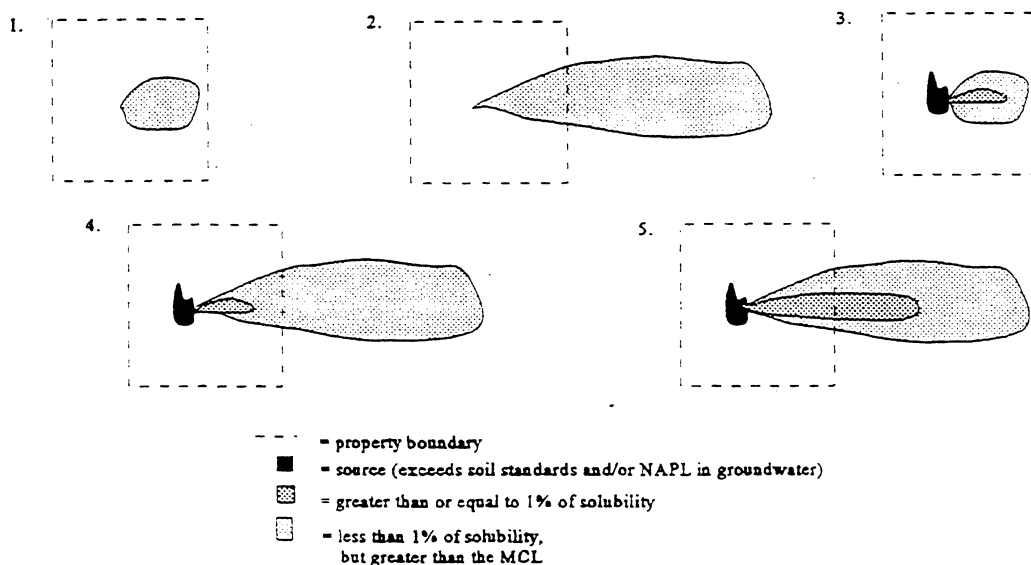
ATTACHMENT 1

“Definition of Source and Location of Source” to be applied to the Source Liability Proposal

A source is defined as:

1. Concentrations of contaminants in soil above an aquifer that exceed the applicable soil cleanup standards established pursuant to ARS 49-151 and 49-152.
2. Any identifiable non-aqueous phase liquids (e.g. free product) in soil or water.
3. Zones of dissolved phase organic contaminants in surface water or groundwater at levels greater than or equal to 1% of the solubility of the contaminant or contaminants.
4. (Mutually acceptable sentence relating to inorganics/metals)

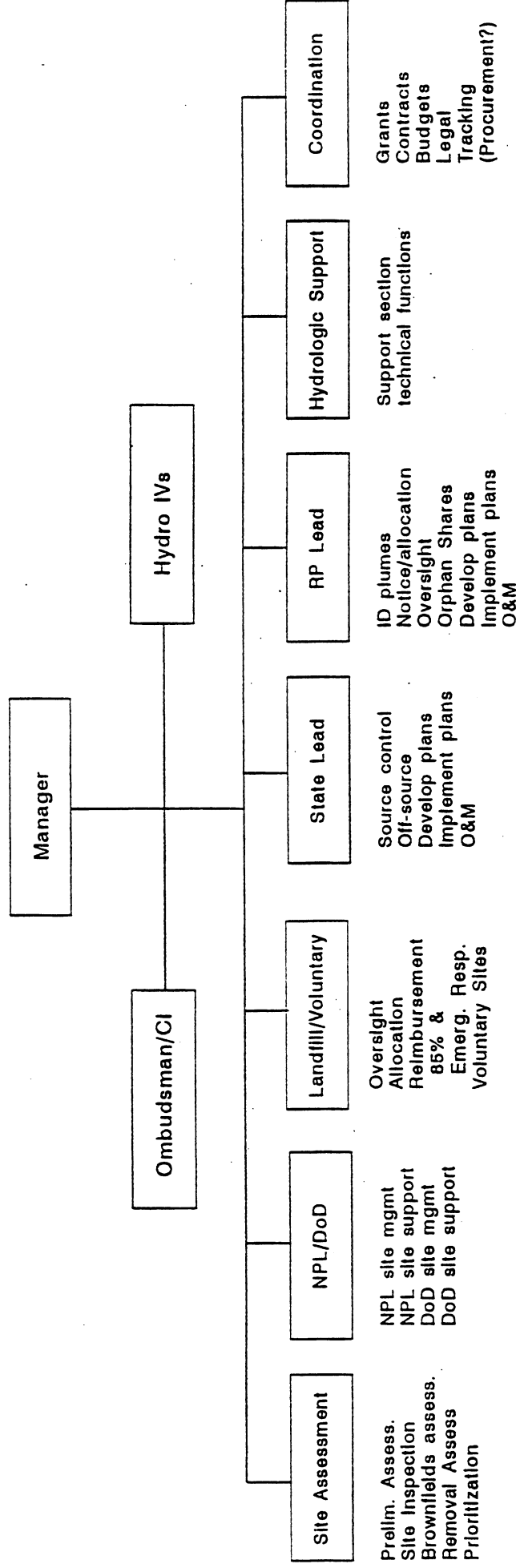
Sources as defined above may be located within the property boundary or may extend beyond the property boundary or both.



Remediation of the lightest colored areas would always be WQARF-funded. Remediation of the two darkest colored areas would always be privately-funded.

Proposed Remedial Projects Section Organization

under Cities Proposed Liability Scheme



- Hydrologic Support and Assessment function (Water Quality Division) remains the same
- Emergency Response function remains the same
- Additional procurement staff needed (in the section?)

prepared September 26, 1996

Revised November 6, 1996

SUMMARY OF WQARF PROGRAM COSTS UNDER CITIES' LIABILITY PROPOSAL

Site budgets: (includes state match for SIBW)

FY 98:	<u>Remedial Projects Unit Sites:</u>	\$7,630,750
	<u>Pre-Remedial Unit Sites:</u>	<u>\$2,660,000</u>
		\$10,290,750
 FY 99:	<u>Remedial Projects Unit Sites:</u>	\$7,237,500
	<u>Pre-Remedial Unit Sites:</u>	<u>\$7,295,000</u>
		\$14,532,500

Costs to support positions (Remedial Projects), including ERE, indirect, travel, equipment, other op:

Current:	\$1,180,119
needs:	<u>\$ 850,505</u> - 853,126 (NEW positions)
	<u>\$2,030,624</u> <u>2,033,245</u>

Professional and Outside (Remedial Projects)

Medical monitoring, Dunn & Bradstreet, training, paralegal
\$84,000

Cost to support positions (Hydrologic Support and Assessment), includes same as above.

Current:	\$673,769
needs:	<u>\$134,145</u> (new positions for database development/support)
	<u>\$807,914</u>

Professional & Outside (HSAS):

Medical monitoring, State Land, fixed station network, etc.
\$189,391

Preliminary Assessment/Site inspection program:

(Using estimates from Future Sites working group)

Staff (3 FTEs):	\$ 196,807
Lab/supplies:	39,333
Travel (in state):	<u>60,000</u>
	296,140

Emergency response:

ADEQ: \$250,000 (no change)
Municipalities: \$450,000 (assumes 3 will reach \$150,000 cap)
\$700,000

Attorney General's Office: This is from actual requests made for 98 & 99

FY98: \$881,000
FY99: \$1,080,590

\$1,080,590 is assumed to be the steady state after FY99.

Department of Water Resources:

WQARF Program: \$ ~~200,000~~ 249,587
Well Inspection Program: 2,553,722
Data Management: ~~203,808~~ 178,007
WQARF Water & Water
Rights Acquisition 36,153
~~\$2,994,491~~ 3,017,469

Allocation (assumes technical data are sufficient):

2 per month, or 24 per year
Expert witness, records copies, allocator
\$62,000 each, **\$1,488,000**

Litigation:

8 per year
\$15,000 each, if prior allocation process
\$70,000 each, if straight to court:
Assume 6 @ \$15K, 2 @ \$70K **\$230,000**

Appeals:

3 per month, (36 per year) @ \$1000 each: **\$36,000**

Advisory board: **\$10,000**

Depends greatly on make-up, duties, number of meetings, etc.

Community Involvement:

Fact Sheets, newsletters, public notice, community advisory boards, etc.
\$321,600

TOTAL: FY98: ~~\$17,699,910~~ \$20,385,509
FY99: ~~\$17,506,250~~ \$24,826,849

Remedial Projects Unit
Projected Response Costs under the Cities' Liability Proposal
Fiscal Years 1998-99

Note: Various site prioritization schemes would be expected to alter the results of this analysis. At landfill sites, ADEQ's portion includes orphan shares, deMinimus parties, and exempted small business. No attempt has been made to estimate costs associated with access or costs of undetermined orphan sources.

SITE NAME AND INFO

FY'98

FY'99

Broadway-Pantano - Currently, this project is participating party lead. Under the Cities' Proposal, ADEQ may be responsible for apportioning liability between the responsible parties.

WQARF Remedial Action Costs: Oversight and legal costs are the only WQARF costs anticipated.

Other Considerations:

Allocation Costs: ADEQ may need to participate in allocation in 1998 and 1999.

Campbell Ave Voluntary Site - Voluntary project. Only WQARF oversight costs anticipated.

Deer Valley Computer Park - Groundwater treatment plant is under construction for aquifer restoration. Honeywell is doing the work but may insist on contribution from prior operators. Oversight costs may be ADEQ's only costs.

Other Considerations:

Allocation: ADEQ may be involved in extensive disputes between Honeywell and past operators. Orphan shares are a possibility, but not likely.

Del Rio Landfill - Possible off-site groundwater cleanup

needed; however, project may not be considered as high a priority as many other sites. Off-site plume definition work and development of a RAP for off-site work is anticipated in FY'98-99. Orphan shares may exist at this site. Cost estimates assume a 25% orphan share.

Remedial Action Costs:

Completion of off-site investigations for gr. water RAP.	\$25,000	\$25,000
Risk Assessment in 1988.	\$ 3,750	
O&M for gas mitigation system (estimates provided by City of Phoenix.)	\$47,500	\$47,500
TOTAL	\$76,250	\$72,500

Eagle Pitcher Mill - No additional work anticipated.

East Washington - See West Van Buren/East Washington

El Camino del Cerro - Up to \$45,000,000 may be needed for a groundwater pump and treat remedy. There is a possibility of other sources besides the landfill, thus requiring extensive studies by ADEQ. Cost estimates assume a 25% orphan share.

WQARF Remedial Action Costs:

Investigations: There are potential unknown sources within the study area. ADEQ would need to obtain as much info as possible about these sources thru PA/SI's and other investigations.	\$50,000	\$50,000
Operation of pilot scale gr. water system.	\$50,000	
Design of final groundwater pump and treat system(s)	\$75,000	
Construction of final gr. water treatment system.		\$500,000
O&M of gas mitigation system	\$125,000	\$125,000
Soil vapor extraction (2 systems per year)	\$250,000	\$250,000

Possible well-head treatment at trailer park well.		\$55,000
Final Site Risk Assessment:	\$6,250	
TOTAL:	\$680,000	\$980,000

Other Considerations:

Orphan Shares: ADEQ would likely be responsible for orphan shares for the groundwater remedy,

Allocation: ADEQ would be expected to be involved in extensive arbitration.

ESCO - No additional work anticipated.

Estes Landfill - The City of Phoenix is currently completing a groundwater feasibility study. ADEQ may be responsible for orphans, de minimus, and small business. Costs estimates assume 25% ADEQ contribution.

WQARF Remedial Action Costs:

Investigations: Preliminary design information will be required.	\$37,500	
Detailed source investigations for contribution.	\$125,000	\$125,000
Groundwater Remediation: Design of the treatment system would be expected during FY'98, and construction and operation during FY'99.	\$50,000	\$250,000
Soil vapor extraction (1 per year).	\$125,000	\$125,000
Landfill containment actions (cap or other)	\$50,000	\$250,000
TOTAL:	\$387,500	\$750,000

Other Considerations:

Orphan Shares: ADEQ may be responsible for orphan shares for source control and the groundwater remedy.

Allocation: ADEQ would be expected to be involved in allocation with any other sources.

GW Silicones - Ongoing groundwater pump and treat project.

It is currently unknown whether the Cities' Proposal would have any impacts on this privately funded project.

Hexcel - No current groundwater impacts, and thus, no anticipated impacts from the Cities' Proposal.

Honeywell Peoria - Groundwater treatment plant is under construction for aquifer restoration. Honeywell is doing the work but may insist on contribution from past operators. Oversight costs may be ADEQ's only costs.

Other Considerations:

Allocation: ADEQ may be involved in extensive dispute between Honeywell and past operators. Orphan shares are a possibility, but not likely.

Indian Bend Wash (South) - ADEQ will be required to pay 10% of EPA funded remedial actions at this site.

WQARF Remedial Action Costs (as estimated by EPA):	\$22,000	\$445,000
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Intel - MCL exceedances limited to the release area on Intel's property, from Intel's activities. The Cities' Proposal, should it be adopted, would be expected to have no effect on this project. ADEQ's costs will be limited to oversight.

Mesa DBCP - On-going well-head treatment for DBCP. No effects expected.

Miracle Mile - No PRPs have been positively identified. More source investigations are needed. ADEQ is already preparing for a fund lead pump and treat remedy.

WQARF Remedial Action Costs:

Investigations: Source investigations, including PA/SIs are necessary for this project. Also, monitoring data	\$200,000	\$200,000
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are needed for design of the treatment system(s)

Groundwater pump and treat: It is assumed that at least one pump and treat system will be installed in 1998 (O&M in 1999). Also, depending on subsequent data, another system could be necessary by 1999.	\$500,000	\$500,000
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Risk Assessment:	\$70,000	
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TOTAL	\$770,000	\$700,000
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Other Considerations:

Orphan Shares: This is a given.

Access will be a major issue in FY'98.

Community Involvement: At least one public open house is planned in the period of FY'98-99.

Mission Linen - Mission Industries is currently conducting an RI/FS of on-site soils and associated groundwater contamination. There is an issue of comingling plumes in this area.

WQARF Remedial Action Costs: ADEQ would need to evaluate other source areas.	\$150,000	\$25,000
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TOTAL	\$150,000	\$25,000
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Other Considerations:

Allocation: ADEQ may be involved in allocation if other sources are likely.

Orphan Shares: ADEQ may need to pay a portion of the site's cleanup costs.

Motorola Mesa - Motorola continues groundwater pump and treat. No impacts expected.

Other Considerations:

Motorola 56th St. - Motorola is currently conducting SVE and pilot scale groundwater treatment actions, and estimates that the total future site cleanup will be \$4,000,000. The potential for other sources has not been verified. Thus, only oversight costs are anticipated.

Nogales Wash - Currently state lead. No changes anticipated.

WQARF Remedial Action Costs:	\$20,000	N/A
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Payson PCE - Currently state lead. No viable PRPs have been identified. This project may continue as state lead throughout, regardless of selected liability scheme. ADEQ will continue groundwater pump and treat. *These cost estimates assume that the Town of Payson will enter into an intergovernmental agreement with ADEQ, whereby the Town will operate the system for its drinking water supply. Otherwise, ADEQ's costs may double.*

WQARF Remedial Action Costs (include risk assessment):	\$370,000	\$250,000
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Other Considerations (regardless of liability scheme):

Access: Access for installation of wells and the final groundwater treatment system is an issue.

Community Involvement: At least one public meeting will be needed in FY'98 or FY'99.

Pinal Creek - Currently, the Pinal Creek Group is performing off-site groundwater cleanup. The Cities' Proposal may place the burden of orphan shares and additional investigations on the state. The Pinal Creek Group has estimated that the final groundwater remedy will cost between \$95,000,000 - \$420,000,000. *If the District Court rules against the Pinal Creek Group on its CERCLA contribution action, this, coupled with the Cities' Proposal, may affect the Pinal Creek Group's ability to continue the work.*

WQARF Remedial Action Costs: Additional source investigations	\$200,000	\$200,000
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TOTAL:	\$200,000	\$200,000
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Other Considerations:

Orphan shares: ADEQ may be responsible for extensive orphan shares on this project, which could total up to 20% of the entire cleanup up costs (up to (\$80,000,000)).

Allocation: ADEQ may need to participate in a lengthy allocation process.

Quartzsite PCE - ADEQ is continuing its preliminary investigation.

WQARF Remedial Action Costs: ADEQ will need to continue detailed source investigations. Some of the costs may be borne by the responsible parties, although ADEQ may take the lead on the remedial action.	\$250,000	
Other investigations: ADEQ would need to characterize the plume for RD purposes.	\$250,000	
Groundwater Treatment System Design:	\$100,000	\$200,000
Treatment System Construction:		\$500,000
Risk Assessment	\$70,000	
TOTAL:	\$670,000	\$700,000

Other Considerations:

Access: For gr. water treatment system.

Community Involvement: 1 public meeting in each of the next two fiscal years.

Allocation/Orphan shares: Following a lengthy arbitration period, ADEQ may still be responsible for a vast majority of project costs. Most businesses are small business under the Cities' proposal.

Raymond Street - ADEQ is continuing its preliminary groundwater studies, while a prior operator is investigating the facility. The Cities' Proposal would require continual WQARF expenditures.

WQARF Remedial Action Costs: ADEQ would need to continue source identification.	\$100,000	\$100,000
Groundwater Studies: ADEQ would need to characterize the plume for RD.	\$100,000	\$150,000
ADEQ may need to design a groundwater treatment system (projected for FY'99, provided the priority of this project is high enough). Prior operator may take the lead, provided they are a source, but this is premature to determine.		\$150,000
Risk Assessment:	\$15,000	
TOTAL	\$215,000	\$400,000

Other Considerations:

Access: This is an issue for the RI/FS and for the final cleanup action, if ADEQ takes the lead on the project.

Orphan Shares: ADEQ may be required to pay for a large percentage of the groundwater cleanup.

Allocation: ADEQ may be involved in allocation processes, the extent of which will depend on source discovery.

Community Involvement: ADEQ would anticipate at least one public meeting by FY'99.

Schultz Fluff Dump Site - No change in project scope anticipated.

WQARF Remedial Action Costs: Removal action	\$120,000	N/A
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Los Reales Landfill - City of Tucson is lead on all issues. ADEQ

may be responsible for orphan shares. Cost estimates assume 25% for orphans, de minimus, and small business. The City of Tucson estimated that the project would cost \$2,300,000 thru the year 2000.

WQARF Remedial Action Costs:

Treatment System Construction:	\$250,000	
Treatment System O&M, etc.		\$187,500
TOTAL	\$250,000	\$187,500

Other Considerations:

Silverbell Jail Annex Landfill - See Los Reales Landfill (similar project).

WQARF Remedial Action Costs:	\$250,000	\$187,500
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Vulture Mill - ADEQ is the lead and has applied to the AZ Water Protection Fund for a grant. Nevertheless, in the event the application is not approved, WQARF funds should be available.

WQARF Remedial Action Costs: Removal Contingency (transport and disposal of mill tailings) in 1998. Groundwater cleanup in 1999. Also, risk assessment in 1998.	\$1,600,000	\$400,000
TOTAL	\$1,600,000	\$400,000

Other Considerations:

Access: ADEQ may need monies to properly secure property access.

Community Involvement: A community meeting is appropriate in FY'98.

Orphan Shares: ADEQ may be responsible for 100% of the source removal action at this site.

West Van Buren/East Washington - (comprising the Central Phoenix Groundwater Plume) - Total costs are expected to total over \$60,000,000 for plume management, including source control.

WQARF Remedial Action Costs:

Investigations: RI/FS, PRP searches, source investigations, continued plume definition (gr. water sampling, etc.), groundwater model development, private well study, allocation data.	\$700,000	\$500,000
Soil Vapor Extraction: Mostly PRP lead. However, Orphan shares, impossible to calculate at this time, may be paid by the state, and could be significant.		
Off-site plume management: Assume that one ground-water treatment system will be designed and installed by ADEQ in 1998 and one in 1999 (O&M will also be a significant factor by 1999). Top priority will be given to minimizing the plume's spread to the west, toward Tolleson.	\$1,000,000	\$1,250,000
Risk Assessment:		\$90,000
TOTAL:	\$1,700,000	\$1,840,000

Other Considerations:

Access: Extensive site access considerations.

Orphan Shares: ADEQ may be responsible for substantial orphan shares for source remediation.

Community Involvement: ADEQ would anticipate at least 1 public meeting per year, and all associated activities and costs.

Allocation: ADEQ may be required to expend exhaustive

resources on source control allocation.

Note - There are extensive and complex issues associated with this project. Under the Cities' Proposal, where detailed source information is needed and where ADEQ performs all off-site work, two dedicated project managers and two dedicated hydrologists are needed for work on the Plume.

Western Ave. PCE Plume - This is currently an ADEQ preliminary investigation. Source ID work is necessary.

WQARF Remedial Action Costs: Source investigations and groundwater sampling/plume definition, leading toward a RAP by FY'99.	\$150,000	\$100,000
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Other Considerations:

Access to monitor well and soil gas locations will be necessary.

Orphan Shares: An issue by 1999, when source control may be implemented. The PRPs may not be Viable.

Allocation: An issue by 1999 for source control work.

Risk Assessment: A risk assessment may be needed in 1999.

(Western Ave., ctd.)

Community Involvement: Coordination with the Towns of Goodyear and Avondale and a public open house by 1999 would be necessary.

<i>RPU TOTAL SITE COSTS (CONTRACTOR ONLY)</i>	<i>\$7,630,750</i>	<i>\$7,237,500</i>
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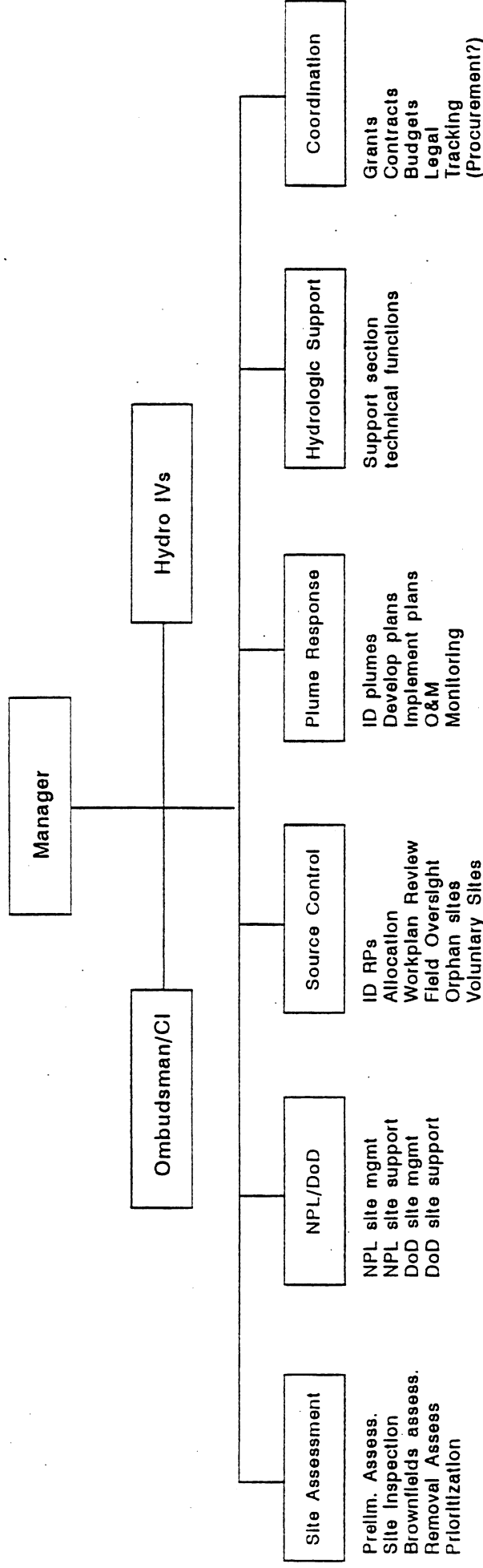
**DRAFT PROJECTED TOTAL WQARF PROGRAM COSTS
ARIZONA DEPARTMENT OF WATER RESOURCES**

WQARF Program	\$ 249,587
Well Inspection Program	2,553,722
Data Management Program	203,808
WQARF Water and Water Rights Acquisition Program*	<u>36,153</u>
GRAND TOTAL	\$3,043,270*

*Does not include costs for purchase and retirement of groundwater rights, which are expected to be high. Does not include any additional costs related to activities recommended by the End Use Subcommittee.

Proposed Remedial Projects Section Organization

under Proposed Source Liability Scheme



- Hydrologic Support and Assessment function (Water Quality Division) remains the same
- Emergency Response function remains the same
- Additional procurement staff needed (in the section?)
- Cost Recovery staff reduced or eliminated

prepared September 26, 1996

Revised November 6, 1996 per current "source" definition of 1% solubility)
SUMMARY OF WQARF PROGRAM COSTS UNDER SOURCE LIABILITY

Site budgets: (includes state match for SIBW)

FY 98:	<u>Remedial Projects Unit Sites:</u>	\$16,262,000 <u>17,762,000</u>
	<u>Pre-Remedial Unit Sites:</u>	\$ 2,140,000
		<u>\$19,902,000</u>
 FY 99:	 <u>Remedial Projects Unit Sites:</u>	 \$26,595,000 <u>31,865,000</u>
	<u>Pre-Remedial Unit Sites:</u>	\$ 8,170,000
		<u>\$40,035,000</u>

Costs to support positions (Remedial Projects), including ERE, indirect, travel, equipment, other op:

Current:	\$1,180,119
needs:	\$ 850,505 <u>853,126</u> (NEW positions)
	\$2,030,624 <u>2,033,245</u>

Professional and Outside (Remedial Projects)

Medical monitoring, Dunn & Bradstreet, training, paralegal
\$84,000

Cost to support positions (Hydrologic Support and Assessment), includes same as above.

Current:	\$673,769
needs:	<u>\$134,145</u> (new positions for database development/support)
	\$807,914

Professional & Outside (HSAS):

Medical monitoring, State Land, fixed station network, etc.
\$189,391

Preliminary Assessment/Site inspection program:

(Using estimates from Future Sites working group)

Staff (3 FTEs):	\$ 196,807
Lab/supplies:	39,333
Travel (in state):	<u>60,000</u>
	296,140

Emergency response:

ADEQ:	\$250,000 (no change)
Municipalities:	\$450,000 (assumes 3 will reach \$150,000 cap)
	\$700,000

Attorney General's Office: This is from actual requests made for 98 & 99

FY98: \$706,000

FY99: \$905,590

\$905,590 is assumed to be the steady state after FY99.

Department of Water Resources:

WQARF Program: \$ ~~200,000~~ 249,587

Well Inspection Program: 2,553,722

Data Management: ~~203,368~~ 178,007

WQARF Water & Water

Rights Acquisition 36,153

~~\$2,994,491~~ \$3,017,469

Department of Health Services: for risk assessment services

FY98: \$435,000

FY99: \$190,000

An average of these two will be used as a steady state: **\$357,000**

(We have funded ADHS at about \$384K in the past)

Allocation (assumes technical data are sufficient):

2 per month, or 24 per year

Expert witness, records copies, allocator

\$20,000 each, **\$480,000**

Litigation:

8 per year

\$25,000 each, if prior allocation process: \$200,000

\$45,000 each, if straight to court: \$360,000

Assume 6 @ \$25K, 2 @ \$45K \$240,000

Appeals:

3 per month, (36 per year) @ \$1000 each: **\$36,000**

Advisory board: **\$10,000**

Depends greatly on make-up, duties, number of meetings, etc.

Community Involvement:

Fact Sheets, newsletters, public notice, community advisory boards, etc.

\$321,600

TOTAL: FY98: ~~\$25,593,160~~ \$29,258,759

FY99: ~~\$35,880,760~~ \$49,346,349

[REVISED PER CURRENT "SOURCE" DEFINITION OF GROUNDWATER CONCENTRATIONS EXCEEDING THE 1% SOLUBILITY CONCENTRATION - THE MOST RECENT CHANGES HAVE BEEN REDEFINED]

November 5, 1996

**Remedial Projects Unit
Projected Response Costs under Source Liability Proposal
Fiscal Years 1998-99**

Note: Various site prioritization schemes would be expected to alter the results of this analysis.

<u>SITE NAME AND INFO</u>	<u>FY'98</u>	<u>FY'99</u>
Broadway-Pantano - Currently, this project is participating party lead. Under the Source Liability Proposal, ADEQ may be responsible for remediation of the <u>entire</u> plume, which has impacted a downgradient hospital well.		
WQARF Remedial Action Costs:		
Investigations: Limited to design information for ground-water treatment system.	<u>\$200,000</u>	<u>\$100,000</u>
Source Control: participating party lead; no orphan shares anticipated.		
Remediation: groundwater pump and treat (design in 1998; constr. In 1999)	<u>\$300,000</u>	<u>\$1,000,000</u>
TOTAL	<u>\$500,000</u>	<u>\$1,100,000</u>

Other Considerations:

Community Involvement: ADEQ sponsored public meeting in 1998.

Risk Assessment (RA): Full RA in early 1998.

Allocation Costs: ADEQ may need to participate in arbitration for source soil cleanup work in 1998.

Access costs for system constr. and piping in 1999.

SITE NAME AND INFO**FY'98****FY'99**

Campbell Ave Voluntary Site - no known off-site contamination

Deer Valley Computer Park - Groundwater treatment plant is under construction for aquifer restoration. Should the Source proposal be adopted, ADEQ may be responsible for O&M of the system.

WQARF Remedial Action Costs:

Operation and Maintenance of system:	\$450,000	\$450,000
TOTAL	\$450,000	\$450,000

Other Considerations:

Legal: Develop alternatives for assuming operation and maintenance of Honeywell's treatment system.

Community Involvement: One public open house is anticipated in FY'98.

Other: ADEQ may be asked to reimburse Honeywell for capital equipment.

Del Rio Landfill - Possible off-site groundwater cleanup needed; however, project may not be considered as high a priority as many other sites. Off-site plume definition work and development of a RAP for off-site work is anticipated in FY'98-99.

WQARF Remedial Action Costs:

Completion of off-site investigations for gr. water RAP.	<u>\$200,000</u>	<u>\$200,000</u>
TOTAL	<u>\$200,000</u>	<u>\$200,000</u>

Other Considerations:

Access: Access to monitor well locations would be needed.

Risk Assessment: Critical to RAP development (1999).

SITE NAME AND INFO**FY'98****FY'99**

(Del Rio, ctd.)

Community Involvement: One ADEQ-lead public meeting (1999).

Allocation: ADEQ may need to be involved in intensive arbitration for source soil cleanup work.Orphan Shares: ADEQ may be responsible for up to 50% orphan shares for any additional source soil cleanup work.*Eagle Pitcher Mill* - No additional work anticipated.*East Washington* - See West Van Buren/East Washington*El Camino del Cerro* - Up to \$45,000,000 may be needed for a groundwater pump and treat remedy, ~~most of which~~ may be the responsibility of ADEQ under the Source Liability Proposal.

WQARF Remedial Action Costs:

Investigations: There are potential unknown sources within the study area. ADEQ would need to obtain as much info as possible about these sources thru PA/SI's and other investigations. Also, ADEQ would need to begin developing necessary Information for a groundwater RAP.	<u>\$700,000</u>	\$300, 000
Design of groundwater pump and treat system(s)		<u>\$350,000</u>
Possible well-head treatment at trailer park well.		\$220,000
TOTAL:	<u>\$700,000</u>	<u>\$870,000</u>

Other Considerations:

Orphan Shares: ADEQ may be responsible for orphan shares for various soil cleanup actions.

Access: Extensive site access will be required for additional investigations and for groundwater treatment system(s).

Community Involvement: ADEQ-lead open house at least by FY'99.

SITE NAME AND INFO

FY'98

FY'99

(El Camino, ctd.)

Risk Assessment: A final site risk assessment would be essential (1998).

Allocation: ADEQ would be expected to be involved in arbitration over soil remediation.

ESCO - No additional work anticipated.

Estes Landfill - The City of Phoenix is currently completing a groundwater feasibility study. Under the Source Liability Proposal, ADEQ may be responsible to implement the entire groundwater RAP.

WQARF Remedial Action Costs:

Investigations: Preliminary design information will be required. **\$200,000**

Groundwater Remediation: Design of the treatment system **\$250,000** **\$2,000,000**
would be expected during FY'98, and construction
and operation during FY'99.

TOTAL: **\$450,000** **\$2,000,000**

Other Considerations:

Orphan Shares: ADEQ may be responsible for orphan shares for various soil cleanup actions.

Access: Extensive site access will be required for additional investigations and for groundwater treatment system(s).

Community Involvement: ADEQ-lead open house at least by FY'98.

Allocation: ADEQ may be expected to be involved in arbitration over soil remediation.

GW Silicones - Ongoing groundwater pump and treat project. It is currently unknown whether the Source Liability Proposal would have any impacts on this privately funded project.

SITE NAME AND INFO**FY'98****FY'99**

Hexcel - No current groundwater impacts, and thus, no anticipated impacts from the Source Liability Proposal.

Honeywell Peoria - Source control has been implemented.

The Source Liability Proposal may require substantial WQARF funding for groundwater treatment system. Total future project costs are estimated at \$4.75 million.

WQARF Remedial Action Costs: Construction of treatment system **\$250,000** **\$450,000**
in FY'98 and O&M in FY'99 (costs estimated by Honeywell).

Other Considerations:

Access: Will be a major issue should it be necessary that ADEQ install the system.

Community Involvement: Possible ADEQ lead open house during the FY'98-'99 time period.

Indian Bend Wash (South) - ADEQ will be required to pay 10% of EPA funded remedial actions at this site.

WQARF Remedial Action Costs (as estimated by EPA): **\$22,000** **\$445,000**

Intel - MCL exceedances limited to the release area on Intel's property; however, given the latest source definition, the Source Liability Proposal, should it be adopted, would be expected to require WQARF funding for groundwater work.

WQARF Remedial Action Costs: RAP Development and investigations. \$150,000

Groundwater treatment design/contruction \$450,000

TOTAL \$150,000 \$450,000

Mesa DBCP - On-going well-head treatment for DBCP. No effects expected.

Miracle Mile - No PRPs have been positively identified. More source investigations are needed. ADEQ is already preparing for a fund lead pump and treat remedy.

SITE NAME AND INFO**FY'98****FY'99**

(Miracle Mile, ctd.)

WQARF Remedial Action Costs:

Investigations: Source investigations, including PA/SIs are \$200,000 \$200,000
necessary for this project. Also, monitoring data
are needed for design of the treatment system(s)

Groundwater pump and treat: It is assumed that at least \$500,000 \$500,000
one pump and treat system will be installed in 1998
(O&M in 1999). Also, depending on subsequent data,
another system could be necessary by 1999.

TOTAL \$700,000 \$700,000

Other Considerations:

Orphan Shares: May be required on source control
actions, as will allocation efforts.

Risk Assessment: A risk assessment may be conducted
by FY'98.

Access will be a major issue in FY'98.

Community Involvement: At least one public open house
is planned in the period of FY'98-99.

Mission Linen - Mission Industries is currently conducting an RI/FS
of on-site soils and associated groundwater contamination.
The Source Liability Proposal, if selected, may require ADEQ to conduct
off-site groundwater cleanup.

WQARF Remedial Action Costs: ADEQ would need to define the \$400,000 \$750,000
nature and extent of the plume prior to cleanup. Investigations
could proceed thru 1998, culminating in a RAP. Remedial Design
and treatment system construction would then ensue in 1999.

TOTAL \$400,000 \$750,000

Other Considerations:

Risk Assessment: One would be completed in 1998.

SITE NAME AND INFO**FY'98****FY'99**

(Mission Linen, ctd.)

Community Involvement: One public open house in 1998.

Access: ADEQ would need access for groundwater pump and treat components.

Motorola Mesa - Motorola continues groundwater pump and treat and has estimated that total future costs will be \$1,000,000 for operation and maintenance. The Source Liability Proposal may effect O&M funding.

WQARF Remedial Action Costs: ADEQ may need to pay for O&M.	\$100,000	\$100,000
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TOTAL:	\$100,000	\$100,000
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Other Considerations:

Legal: O&M funding negotiations.

Other: There may be a possibility that Motorola will request that ADEQ reimburse the company for some of the capital costs of the treatment system.

Motorola 56th St. - Motorola is currently conducting SVE and pilot scale groundwater treatment actions, and estimates that the total future site cleanup will be \$4,000,000. The Source Liability Proposal may require ADEQ to conduct the ~~off-site portion of the~~ cleanup.

WQARF Remedial Action Costs: FY'98 may include remedial design, and the treatment system would be constructed in FY'99.	<u>\$350,000</u>	<u>\$2,500,000</u>
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Total:	<u>\$350,000</u>	<u>\$2,500,000</u>
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Other Considerations:

Community Involvement: At least one public meeting and associated costs/activities anticipated in FY'98.

SITE NAME AND INFO**FY'98****FY'99**

(Motorola 56th St. ctd.)

Access: An issue for installation and operation of treatment system.

Nogales Wash - Currently state lead. No changes anticipated.

WQARF Remedial Action Costs:

\$20,000**N/A**

Payson PCE - Currently state lead. No viable PRPs have been identified. This project may continue as state lead throughout, regardless of selected liability scheme. ADEQ will continue groundwater pump and treat. *These cost estimates assume that the Town of Payson will enter into an intergovernmental agreement with ADEQ, whereby the Town will operate the system for its drinking water supply. Otherwise, ADEQ's costs may double.*

WQARF Remedial Action Costs (Total):

\$300,000**\$250,000**

Other Considerations (regardless of liability scheme):

Access: Access for installation of wells and the final groundwater treatment system is an issue.

Community Involvement: At least one public meeting will be needed in FY'98 or FY'99.

Risk Assessment: By 1998.

Pinal Creek - Currently, the Pinal Creek Group Is performing off-site groundwater cleanup. The Source Liability Proposal may place the burden of these cleanup efforts on the state. The Pinal Creek Group spent \$5,000,000 in the last year. Should ADEQ take over the groundwater aspects of this project, ADEQ may expect to spend approximately that amount in 1998 and more in 1999, for continued interim groundwater treatment and final treatment system construction. ~~*If the District Court rules against the Pinal Creek Group on its CERCLA contribution action, this, coupled with the Source Liability Proposal, may affect the Pinal Creek Group's ability to continue the work. Should the Pinal Creek Group continue as the working entity, these costs estimated here, which are substantial, may not be borne by ADEQ.*~~

WQARF Remedial Action Costs: Operation and Maintenance of

\$3,000,000**\$3,000,000**

SITE NAME AND INFO**FY'98****FY'99**

(Pinal Creek, ctd.)

Interim treatment system and other tasks (possible private well construction costs, possible treatment plant construction for biological/chemical treatment, groundwater monitoring, surface soil and stream sediment sampling, surface water monitoring.

Final System Design Costs:

\$2,000,000

Final System Construction (begin):

\$10,000,000

TOTAL:

\$5,000,000

\$13,000,000

Other Considerations:

Access: Major access considerations will be required.

Orphan shares: ADEQ may be responsible for a portion of the orphan shares to implement source control.

Community Involvement: ADEQ may need to take the lead of two public meetings in 1998-1999.

Allocation: ADEQ may need to participate in a lengthy allocation process for source control. It should also be noted that, as with the case on many other projects, ADEQ's oversight efforts of source control activities would be substantial.

Note: This project will require the full attention of an ADEQ project manager and hydrologist. Additional staff would be requested under the Source Liability Proposal for this project.

Quartzsite PCE - ADEQ is continuing its preliminary investigation.

WQARF Remedial Action Costs: ADEQ will need to continue detailed source investigations for soil vapor extraction.

\$250,000

Other investigations: ADEQ would need to characterize the plume for RD purposes.

\$250,000

Groundwater Treatment System Design:

\$100,000

\$200,000

SITE NAME AND INFO**FY'98****FY'99**

(Quartzsite, ctd.)

Treatment System Construction:

\$500,000

TOTAL:

\$600,000**\$700,000**

Other Considerations:

Access: For gr. water treatment system.

Community Involvement: 1 public meeting in each
of the next two fiscal years.Allocation/Orphan shares: ADEQ may be responsible
for a major portion of any source control
activities, due to potentially nonviable
parties.

Risk Assessment: Essential to this project (1988).

Raymond Street - ADEQ is continuing its preliminary
groundwater studies, while Motorola is investigating
their facility. The Source Liability Proposal would require continual
WQARF expenditures.WQARF Remedial Action Costs: ADEQ would need to
continue source identification for soil cleanup remedies.

\$100,000

\$100,000

Groundwater Studies: ADEQ would need to characterize
the plume for RD.

\$100,000

\$150,000

ADEQ would need to design a groundwater treatment
system (projected for FY'99, provided the
priority of this project is high enough).

\$150,000

TOTAL

\$200,000**\$400,000**

Other Considerations:

Access: This is an issue for the RI/FS and for
the final cleanup action.Orphan Shares: ADEQ may be required to pay for
a percentage of the source cleanups.

SITE NAME AND INFO**FY'98****FY'99**

(Raymond St., ctd.)

Allocation: ADEQ may be involved in allocation processes for source control.

Community Involvement: ADEQ would anticipate at least one public meeting by FY'99.

Risk Assessment: ADEQ would complete one risk assessment (1999).

Schultz Fluff Dump Site - No change in project scope anticipated.

WQARF Remedial Action Costs: Removal action	\$120,000	N/A
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Los Reales Landfill - City of Tucson lead on all issues. ADEQ may be responsible for off-site groundwater treatment under Source Liability Proposal. The City of Tucson estimated that the project would cost \$2,300,000 thru the year 2000.

WQARF Remedial Action Costs:

Treatment System Construction:	\$1,000,000	
Treatment System O&M, etc.		\$750,000
TOTAL	\$1,000,000	\$750,000

Other Considerations:

Community Involvement: ADEQ would need to take the lead in at least one public open house.

Silverbell Jail Annex Landfill - See Los Reales Landfill (similar project).

WQARF Remedial Action Costs:	\$1,000,000	\$750,000
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Vulture Mill - ADEQ is the lead and has applied to the AZ Water Protection Fund (WPF) for a grant. Nevertheless, in the event the application is not approved, WQARF contingency funds should be available.

Note: ADEQ's WPF application was denied in October 1996.

<u>SITE NAME AND INFO</u>	<u>FY'98</u>	<u>FY'99</u>
(Vulture Mill, ctd.)		
WQARF Remedial Action Costs: Removal Contingency (transport and disposal of mill tailings) in 1988. Groundwater cleanup in 1999.	\$1,600,000	\$400,000
TOTAL	\$1,600,000	\$400,000

Other Considerations:

Access: ADEQ may need monies to properly secure property access.

Risk Assessment: If WQARF funded, a WQARF funded risk assessment may be appropriate (1988)

Community Involvement: A community meeting is appropriate in FY'98.

Orphan Shares: ADEQ may be responsible for 100% of the source removal action at this site.

West Van Buren/East Washington - (comprising the Central Phoenix Groundwater Plume) - Total costs are expected to total over \$100,000,000 for plume management, including source control.

WQARF Remedial Action Costs:

Investigations: RI/FS, PRP searches, source investigations, continued plume definition (gr. water sampling, etc.), groundwater model development, private well study, allocation data.	<u>\$1,500,000</u>	<u>\$1,500,000</u>
Soil Vapor Extraction: Mostly PRP lead. However, Orphan shares, impossible to calculate at this time, may be paid by the state, and could be significant.		
Off-site plume management: Assume that <u>three</u> ground-water treatment systems will be designed and installed by ADEQ in 1998 and <u>three</u> in 1999 (O&M will also be a significant factor by 1999). Top priority will	<u>\$2,000,000</u>	<u>\$4,000,000</u>

SITE NAME AND INFO**FY'98****FY'99**

(West Van Buren/East Washington, ctd.)

be given to minimizing the plume's spread to the west, toward Tolleson.

TOTAL:

\$3,500,000

\$5,500,000

Other Considerations:

Access: Extensive site access considerations.

Orphan Shares: ADEQ may be responsible for substantial orphan shares for source remediation.

Community Involvement: ADEQ would anticipate at least 1 public meeting per year, and all associated activities and costs.

Risk Assessment: A very extensive risk assessment may be prepared by 1999.

Allocation: ADEQ may be required to expend exhaustive resources on source control allocation.

Note - There are extensive and complex issues associated with this project. Under the Source Liability Proposal, where detailed source information is needed and where ADEQ performs all off-site work and a significant portion of groundwater work on source properties, two dedicated project managers and two dedicated hydrologists are needed for work on the Plume.

Western Ave. PCE Plume - This is currently an ADEQ preliminary investigation. Source ID work is necessary.

WQARF Remedial Action Costs: Source investigations and groundwater sampling/plume definition, leading toward a RAP by FY'99.

\$150,000

\$100,000

Other Considerations:

Access to monitor well and soil gas locations will be necessary.

Orphan Shares: An issue by 1999, when soil cleanup may be implemented. The PRPs may not be viable.

SITE NAME AND INFO**FY'98****FY'99**

(Western Ave., ctd.)

Allocation: An issue by 1999 for source control work.

Risk Assessment: A risk assessment may be needed in 1999.

Community Involvement: Coordination with the Towns of Goodyear and Avondale and a public open house by 1999 would be necessary.

RPU TOTAL SITE COSTS (CONTRACTOR ONLY)**\$17,762,000****\$31,865,000*****Risk Assessment Costs:***

Highly complex risk assessment (\$90,000 each)		\$90,000
Risk assessment for medium-sized groundwater project (\$70,000 each)	\$420,000	\$70,000
Relatively routine risk assessments (\$15,000 each)	\$15,000	\$30,000
TOTAL	\$435,000	\$190,000

Minimum new staff requirements for new liability system

OMBUDSMAN (No State Classification Series fits this description -ASO III has been used)

GRADE 22 : \$77,086.00 (First Year cost)

Responsibilities include coordination of policy, program, or project committees for the Water Quality Assurance Revolving Fund Program and manages the outreach and community coordination functions of the Section under the direction of the Section Manager. Duties include supervision of the public information function of the Section for technical and administrative aspects of providing statewide information to department staff, other intergovernmental agencies, and outside committee members along with the general public. Facilitates coordination with the Office of Administrative Counsel and reporting to the Senior Management within ADEQ and the Legislature for the implementation of policies.

CIVIL INVESTIGATOR (State Class Code -39204 Investigator III used)

GRADE 17: \$53,321.00 (First Year cost)

Responsibilities include financial investigations, utilization of online databases for collection of public information, title searching, asset searching, skip tracing (tracking individuals), and site visits for the collection of financial and legal evidence in conjunction with the technical and scientific evidence gathering activities of the preliminary assessment/site investigation technical staff. The Investigator has authority to conduct and certify as a Notary Public the interview(s) conducted in the collection of evidence. Performs duties as the team leader of the investigation in conjunction with technical staff and trains assistants. Detects and verifies administrative, and/or civil violations of laws, rules, regulations and policies enforced by ADEQ in the Water Quality Assurance Revolving Fund Program and prepares reports and case files accordingly.

ACCOUNTANT - INVESTIGATOR (State Class Code -24634 or 76185 used)

GRADE 21: \$72,146.00 (First Year Cost)

Responsible for analysis of the financial statements submitted by the Small Business Community in response to information inquiries from ADEQ. As a Certified Public Accountant (CPA) or equivalent education and experience, a detailed analysis of these financial statements will be conducted in coordination and as a consultant for ADEQ and the Civil Investigator to ascertain the ability to pay for those businesses who are designated as potentially responsible parties. Responsible to act as a financial liaison between ADEQ and the business community and to advise Small Business owners and operators of their potential liabilities under the Water Quality Assurance Revolving Fund Program statutes and rules and the various options available to them. Assists the Voluntary Program Coordinator in development of partnerships with local financial institutions for loans and funding sources available to business for financing environmental cleanup.

PRP SEARCHING (no specific class fits the function needed State Class Code -24634 used)

GRADE 21: \$72,146.00 (First Year cost)

Position is distinguished from the Civil Investigator by the added responsibility as a participating

member of the enforcement team and in coordination with the Arizona Office of the Attorney General as required and management team through the entire investigation. Testifies as required for enforcement actions of ADEQ which have been appealed or are challenged. May encounter long hours of research, fluctuating work hours, interviewing hostile witnesses and some travel as required. Performs professional level investigations of a highly complex nature, working with a high degree of independence and initiative. Trains the subordinate investigators as required on techniques and the unique rules and procedures applicable to the Water Quality Assurance Revolving Fund Program .

CONTRACTS SPECIALIST (State Class Code - Contracts Mgt Specialist III used)

GRADE 20: \$71,512.00 (First Year cost)

Position will be granted a warrant of procurement authority under the guidance, direction, and authority delegated by the State Procurement Office in accordance with the State Procurement Code A.R.S. 41-2501 et seq. and the administrative rules and regulations A.A.C. R2-7-101 et seq. to *streamline and expedite the time element* for the contracting requirements of the Water Quality Assurance Revolving Fund Program. Responsibilities include serving as a liaison between the Agency and Contractors to resolve disputes on contractual issues, facilitating negotiations and award of contractual documents which adhere to applicable rules and procedures, administration of contract terms and conditions, assist and train technical staff with the development of work plans and statements of work for clarity and deliverables, develop program specific procedures and guidance to technical staff on contract administrative issues, and provide data, statistical input, and reports to management as required. Works in coordination with the other applicable Programs and Divisions within the agency.

HYDROLOGIST III (State Class Code for current Hydro III's used)

GRADE 21: \$75,646.00 x 2 each = \$151,292.00 (First Year cost)

Responsibilities include assessment and remediation of Water Quality Assurance Revolving Fund sites as an essential part of the Project Team. Hydrologic support provides the technical data and analysis of source contamination needed to make sound, technically defensible decisions with respect to the investigation and/or remediation of Water Quality Assurance Revolving Fund sites.

Provides primary responsibility for developing or reviewing technical investigation strategies, scopes of work, and work plans for the hydrological work to be performed at sites and that it is performed correctly and adequately documents. Solely responsible for evaluating the hydrologic technical requirements, conclusions and recommendations for work performed at the sites.

Responsible to insure that approved sampling techniques, protocols and procedures are followed.

PUBLIC RELATIONS (State Class Code for current PPSII used)

GRADE 19: \$59,707.00 (First Year cost)

Responsibilities include serving as the liaison to the people of Arizona affected by the decisions, activities and regulations of the Water Quality Assurance Revolving Fund Program. Integrate and coordinate the Water Quality Assurance Revolving Fund Program's public education, outreach, community involvement plans, open houses, public notification, public meetings, public hearings, and community involvement efforts. Develop and implement an educational component to the enforcement programs. Develop public Fact Sheets and Newsletters in coordination with legal and technical staff support. Ensures open communication and that the ADEQ Office of Public Affairs is kept informed about Water Quality Assurance Revolving Fund Program activities within the state of Arizona.

PUBLIC RELATIONS (State Class Code for current PPSI used)

GRADE 17: \$51,626.00 x 2 each = \$103,252.00 (First Year cost)

Responsibilities include serving as the liaison to the people of Arizona affected by the decisions, activities and regulations of the Water Quality Assurance Revolving Fund Program. Integrate and coordinate the Water Quality Assurance Revolving Fund Program's public education, outreach, community involvement plans, open houses, public notification, public meetings, public hearings, and community involvement efforts. Develop and implement an educational component to the enforcement programs. Develop public Fact Sheets and Newsletters in coordination with legal and technical staff support. Ensures open communication and that the ADEQ Office of Public Affairs is kept informed about Water Quality Assurance Revolving Fund Program activities within the state of Arizona.

PARALEGAL II (State Class Code for current Legal II used)

GRADE 17: \$51,626.00 (First Year cost)

Responsible to provide legal support to the Water Quality Assurance Revolving Fund Program and technical staff and functions under the Rules of Court under the ADEQ Office of Administrative Counsel. Drafts generic documents (i.e. notice letters, access letters and agreements, orders, consent decrees, prospective purchaser agreements, etc.) and coordinates with assigned Assistant Attorney General to develop a final draft. Monitors enforcement actions, proposed rules and regulations, proposed laws, and policy/guidance documents. Researches case law as requested. Drafts memoranda of information as appropriate.

ADMINISTRATIVE ASSISTANT II - BUDGETS (State Class Code for AAII used)

GRADE 15: \$45,169.00 (First Year cost)

Responsible for preparing a variety of administrative reports including the quarterly output report in coordination with the higher graded Administrative Assistants for the Water Quality Assurance Revolving Fund Program. Verifies funding availability for new task assignments and amendments for designated projects. Assists the AAIII in compiling the annual projects and draft budget projections for management review. Provides data and statistical input for the Legislative Report in coordination with the Community Involvement Coordinator. Reviews, monitors, and processes monthly contractor invoices for payment.

Position Name	First Year Cost
Ombudsman	\$77,086.00
Civil Investigator	\$53,321.00
Accountant - Investigator	\$72,146.00
PRP Searching	\$72,146.00
Contracts Specialist	\$71,512.00
Hydrologist III (2 @ \$75,646)	\$151,292.00
Public Relations (2 @ \$59,707)	\$119,414.00
Public Relations (2 @ \$51,626)	\$103,252.00
Paralegal II	\$51,626.00
Administrative Secretary - Community Involvement	\$36,162.00
Administrative Assistant II -Budgets	\$45,169.00
TOTAL	\$853,126.00

MINIMUM SITE SCREENING PROGRAM (PASI) REQUIREMENTS UNDER NEW
LIABILITY SYSTEM

Using the report of the sub-sub committee on Future Sites to the Subcommittee on Priorities of the Arizona Groundwater Task Force, the following budget was developed for a state-funded site screening program. The budget is based on the assumption of 100 dry-cleaning sites and 25 mining sites.

Annual budget for 3 year project

Personnel: 3.3 FTEs

including ERE, indirect, and salary: \$58,854/FTE

$3.344 \times \$58,854 = \$196,807$

Sampling Cost

Analyses: \$29,333

Misc Supplies: \$10,000

In-state travel: \$60,000

Total annual budget:

Personnel: \$196,807

Sampling: 39,333

Travel: 60,000

\$296,140

Project cost:

\$3 years \times \$296,140 = \$888,420 (w/ rounding error)

Using the Report of the sub-subcommittee on Future Sites to the Subcommittee on Priorities of the Arizona Groundwater Task Force the following budget was developed. The budget is based on the assumption of 100 dry-cleaning sites and 25 mining sites. The Report of the sub-subcommittee on Future Sites to the Subcommittee on Priorities of the Arizona Groundwater Task Force estimated 277 new sites which included 100 dry-cleaning sites and 25 mining sites. Please realize that this projection is based upon a subset of the total and additional staff and resources may be needed to address the other sites and limitation of the identification of potential future sites from the sub-subcommittee.

Dry-cleaning Sites

- Assumption - From Future Sites Report 100 dry cleaners identified for screening
- Screening will take 80 hours per site
 - This will result in 8000 hours of dry cleaner screening time require to complete the needed effort.
 - Three soilgas samples will be collected during the screening process at each site
 - The analysis cost for the soilgas sample will be \$85 per sample
 - Documentation will not equal the PASI documentation or process, this will be a screening with minimal documentation
 - An FTE has a total of 1500 productive hours in a fiscal year
 - Of the 100 sites screened five percent or four will require removal assessments financed by ADEQ. Only the staff time for this removal assessment is covered in this estimate.
 - It is estimated that a removal assessment will consume 200 hours of staff time at each site. This will result in 800 hours of removal assessment work.
 - The estimated rate of pay for an EPS used for the calculation was \$32,000
 - The estimated expense for ERE at .21 was \$6,720
 - The estimated expense for Indirect at .52 was \$20,134
 - ADEQ will be using the Geoprobe without expense. No major wear and tear of equipment will occur or require replacement of parts or maintenance.
 - This estimate does not include removal contract dollars or any remediation dollars.
 - This estimate does not include initial cost such as computers or other new FTE expense. (Most of this expense could be covered with the vacant PASI positions by split funding the FTE and using existing computers or requesting federal dollars)

Mining Sites

- Assumption - From Future Sites Report 25 identified for Screening
- Due to complexity of mining sites the screening will require 200 hours of staff time per site
 - It will take 5000 hours of an FTE's time to screen the 25 mining sites
 - At least 25 samples for multiple analytes is proposed for the mining sites
 - The estimated rate of pay for an EPS used for the calculation was \$32,000
 - The estimated expense for ERE at .21 was \$6,720
 - The estimated expense for Indirect at .52 was \$20,134
 - Water Protection Grant Applications will be completed for 12.5 of the mining sites which will require 100 hours per site

- For cost projection purposes the analysis of the samples will cost \$100 per sample which will include multiple analytes.

Dry-Cleaning Sites:

100 Sites X 80 hours = 8,000 hours

EPS cost \$32,000 + \$6,720 + \$20,134 = \$58,854

\$58,854 / 1500 hours = \$39.24 (Cost of EPS per hour weighted for productive hours only)

8,000 X \$39.24 = \$313,920

3 samples per site X \$85 per analysis of sample X 100 = \$25,500

Additional cost \$10,000 Misc Supplies

Instate travel Cost \$90,000 (total - life of project 3 years, \$30,000 per year)

Total \$439,420

Per Site Cost

80 hours X \$39.24 = \$3,139

3 samples X \$85 per analysis of sample = \$255

Misc Supplies \$100

Instate travel Cost \$900

total per site \$4,394

Removal Assessments

Assumed 4 sites will require removal assessments

An FTE will require 200 hours to complete a removal assessment

Sampling and Analyses cost is not included in this estimate.

Instate travel will be covered in the above estimate

4 sites X 200 hours = 800

800 hours X \$39.24 = \$31,392

Total Dry-cleaning Site Screening and Removal Assessment of four Sites \$470,812

Mining Sites

25 mining sites proposed for screening

25 mining sites X 200 fte hours = 5,000

5,000 hours X \$39.24 = \$196,200

25 samples per site X 25 sites X \$100 = \$62,500

Misc supplies = \$20,000

Instate travel \$90,000 (total - life of project 3 years, \$30,000 per year)

Total for 25 mining sites \$368,7000

Cost per mining site

200 hours X \$39.24 = \$7,848

25 samples X \$100 = \$2,500

Misc supplies \$800

Instate travel \$3,600

total for a mining site \$14,748

Cost for completing application for Water Protection Grant

100 hours per site is required to compete an application

12.5 sites will have applications completed

12.5 mine sites/applications X 100 hours X \$39.24 = \$49,050

Total for 25 mining sites and 12.5 mining site water protection fund application
\$417,750

Site Prioritization Proposal including Dry-cleaners and Mining sites from Future Sites Report
Total \$470,812 + \$ 417,750 = \$888,562

**ANNUAL COMMUNITY INVOLVEMENT FUNDING NEEDS
IN THE NEW WQARF PROGRAM**

Involvement mechanism	Cost	Comments
Call for Letters of Intent	\$2,500	legal notice in paper
Notice on Proposed Priority List	\$2,500	legal notice in paper
Site Description Package	\$100	distributed during Priority List process
Fact Sheets	\$99,000	One per site, plus special events
Semi-annual newsletters	\$162,000	One per site
Notice on Proposed Remedial Action Plans	\$10,000	\$2,000 per site, assumes 5 per year
Community Advisory Boards	\$5,000	travel expenses
Initial disclosure cards	\$40,500(1st year), then \$1800	disclose to all existing sites, first year, approx. \$900 per new site, assume 2 per year
Annual Total:	\$321,600 (1st year), \$282,900 after 1st year	

Fact sheet, newsletter, disclosure card costs assumes distribution of 15,000 copies.

DIVISION WASTE SECTION REMEDIAL PROJECTS CONT.

FUND NAME		WQARF		P&O	
REGULAR POSITION CLASSIFICATION TITLE	GRADE	TOTAL FTE	PERS SERV FY 1997		
0114 ENV PRGM SPVR OLADE	22	0.25	9,641		
0179 ENV HLTH SPC HIESSLER	19	0.50	14,301		
0511 HYDRO III WHITMORE	21	0.04	1,408		
0802 ST SERV INTERNVACANT	10		14,997		
0804 ST SERV INTERNCRYMES	10		14,997		
0852 ENV PRGN SP BURGESS	20	0.80	25,693		
0940 HYDRO I VACANT	17	1.00	24,367		
0941 HYDRO II VACANT	19	1.00	26,600		
1026 LEGAL ASSIST IMYBECK	19	0.31	8,507		
1027 CLERK TYPIST INORDSKOG	8	1.00	13,440		
1068L HYDRO III ATKINSON	21	1.00	38,138		
1076L ENV PRGM SP VACANT	20	1.00	34,981		
1093 PRGM/PROJS SPDELVECCHIO	19	0.50	13,691		
TOTAL P & O					
TRAVEL OUT					
OTHER OPERATING					
STANDARD @ 1665				12,322	
OTHER					
TOTAL OTHER OPERATING				12,322	
EQUIPMENT					
TOTAL EQUIPMENT					

TOTAL THIS		7.40	240,760
PRIOR PAGES			
TOTAL		7.40	240,760
ERE @			59,805
INDIRECT			150,282

DIVISION

WATER RESOURCES DIVISION

FUND NAME	REGULAR POSITION	GRADE	FTE	PERS SERV FY 1997
0144 ENV PRGM SPEC	THERR	20	1.00	33,636
0152 HYDRO II	KORCHHANI	19	1.00	34,844
0154 ENV HTH SPC II	WILLIAMS	19	1.00	35,000
0516 HYDRO II	TOWNE	19	1.00	33,594
0547 ENV PRGM SPEC	HARUS	20	1.00	32,116
0815 ENV HTH SPC II	VACANT	19	1.00	26,456
0841 EDP PRGM AL III	MORRIS	20	1.00	30,000
0347 ENV PRGM SPEC	FITCH	20	1.00	32,615
0541 HYDRO II	CARTER	19	1.00	20,400
0840 WTR RSR TECH II	VACANT	15	1.00	19,494
Less 18				
TOTAL THIS PAGE			10.00	315,000
PRIOR PAGES				
TOTAL ALL PAGES			10.00	315,000
ERE 0				70,246

PFO		
Red monitoring		2,000
State land dept		10,000
Fixed station network		120,000
Training contracts		4,200
Water Quality Mapping		20,000
Hydro-tech support		20,000
carry over Gls		21,910
TOTAL P & O		198,110
Less 18 Reductions		(8,719)
TOTAL		109,391
TRAVEL III		28,100
Less 18 Reductions		
TOTAL		28,100
TRAVEL OFF		7,600
Less 18 Reductions		
TOTAL		7,600
OTHER OPERATING		
STANDARD 0 1665		16,650
GIS subcriptions		3,000
Topographic maps		1,500
Contract maint Sun System		5,000
Field supplies & maint.		6,000
Printing costs		5,000
References for library		1,000
TOTAL OTHER OPERATING		30,200
Less 18 Reductions		
TOTAL		30,200
EQUIPMENT		
ARC Lic.		9,000
Tin Lic, a ware upgrade		1,000
TOTAL EQUIPMENT		10,000
Less 18 Reductions		
TOTAL		10,000

STATE AND FEDERAL SUPERFUND SITES*
COSTS FOR REMEDIAL ACTIONS (CLEANUP) SPENT BY PARTICIPATING PARTIES

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
A & S Auto ¹²	\$ 11,000	\$11,000	Soil Removal conducted.	Remediation report received in 1996.
Alameda & Priest ¹²	N/A	N/A	Groundwater sampling.	This is a preliminary investigation. Work began in 1995.
Aluminum Dross ²	\$ 7,000	\$7,000	Sampling and removals completed. Fencing of additional areas was needed to isolate the dross from the neighborhood community.	A participating party conducted aerial photo interpretation. Work initiated in 1991.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTIONS COMPLETED	COMMENTS
Apache Powder ¹	\$ 1,795,000	\$1,256,500	Remedial investigation/Feasibility Study completed. Remedial design ongoing. A soil removal action was also conducted.	Site work has been ongoing since 1989; with an estimated 70% of the work performed after January 1, 1991.
Apache Sitgreaves ⁹	\$ 120,000	N/A	Removal and soil treatment completed.	ADEQ estimate. The Forest Service performed the cleanup which was completed in 1991.
Baldwin Metals ⁷	\$ 150,000	\$150,000	Characterization of arsenic contaminated soils.	1996 Voluntary Project
Bitter Creek ⁵	N/A	N/A	See Comments.	Project closed in 1995. WQARF involvement in early 1990's.
Broadway-Pantano ³			RI/FS initiated.	RI/FS commenced in 1996, to be funded by Participating party. Too new for estimate of costs paid by participating party.

SITE NAME	REMEDIAL ACTION COSTS PAID TO DATE	REMEDIAL ACTION COSTS PAID TO DATE	REMEDIAL ACTIONS COMPLETED	COMMENTS
Campbell Avenue'	\$ 350,000	\$350,000	Site characterization.	Voluntary project. Initial report submitted to ADEQ in 1995.
Central & Camelback ¹²	N/A	N/A	See comments	New Site. Preliminary investigation. No WQARF money spent to date.
Chino Valley, Town of ⁹	\$ 3,099	N/A	Groundwater sampling. Groundwater was found to be contaminated with VOC's including benzene.	ADEQ provided state match funding. Work performed since late 1980's
Commercial Bldg. ⁷ 2805/2811 E. Indian School Rd.	\$ 2,000	\$ 2,000	Investigation	Voluntary project since 1996. Costs estimated by ADEQ
Custom SW/-ACT II (aka Phoenix Metro Investments) ⁷	N/A	N/A	Investigation for RI/FS	Voluntary project since 1995 under 2 reimbursement agreements.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTIONS COMPLETED	COMMENTS
Deer Valley Computer Park ^s	\$ 6,150,000	\$ 3,150,000	A pilot scale groundwater treatment plant installed. The final groundwater system has been constructed.	Preliminary investigations began in 1984. Estimates provided by the participating party. Of the appx. \$6.15 million, appx. \$3 million was spent on the RI/FS.
Del Rio Landfill ^s	\$ 1,600,000	\$ 1,200,000	RI/FS and gas collection system.	Investigations began in 1986; with an estimated 75% of the work performed in or after 1991.
Eagle Picher Mill ^s	\$ 420,000	\$ 420,000	Site was capped.	Costs provided by participating party. Work performed after 1992.

SITE NAME	REMEDIAL ACTION COSTS PAID BY EPA	REMEDIAL ACTION COSTS PAID BY OTHERS	REMEDIAL ACTIONS COMPLETED	COMMENTS
East Central Phoenix ²	\$ 24,283	\$ 20,641	ADEQ has expended WQARF funds on investigation and cleanup (soil vapor extraction) at the site.	This project was placed on the WQARF priority list in 1987. An estimated 85% of the site expenditures have been incurred in or after 1991. Soil sampling and well installations conducted by Star Cleaners. While not included in the estimate, SVE wells installed under RCRA may be useful to WQARF.
East Washington ²	\$ 5,674,000	\$ 4,822,900	The RI/FS continues. Pesticide contaminated soils were excavated and treated at the FMC facility and Gabrielli property.	This project was placed on the WQARF priority list in 1987. An estimated 85% of the site expenditures have been incurred in or after 1991. Cost estimates received from FMC, Adobe Air/Arvin Industries, Alamo Rent-A-Car and Gabrielli property. ADEQ estimated costs for ITT Canon, Allied Signal and Brown Tire.

SITE NAME	REMEDIAL ACTION COSTS PAID BY FEDERAL GOVERNMENT	REMEDIAL ACTION COSTS PAID BY STATE GOVERNMENT	REMEDIAL ACTION COSTS PAID BY PRIVATE PARTY	REMEDIAL ACTION COSTS PAID BY OTHER PARTY	COMMENTS
El Camino del Cerro Landfill ²	\$ 5,135,000	\$ 5,135,000			This site was listed on the WQARF Priority List in 1993.
Eloy Airfield ⁷	\$ 131,000	\$ 131,000			RI/FS, implementation of pilot scale groundwater remedy, and landfill gas collection system.
ESCO ⁶	\$ 665,109	\$ 200,000			Pesticide Contaminated soils have been characterized. Removal of thousands of drums, many containing liquid wastes, from the property and the RI/FS. Cleanup recently underway.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTIONS COMPLETED	COMMENTS
Estes Landfill ²	\$ 4,000,000	\$ 3,800,000	RI/FS - ADEQ continues to investigate for other sources of groundwater contamination. A risk assessment was completed by ADHS.	While site work was initiated in the mid 1980's, an estimated 95% of the work has been conducted in or after 1991.
Exxon ⁷	\$ 11,500	\$ 11,500	Groundwater investigation	Voluntary Project since 1996.
Faith Cooperage ⁹	N/A	N/A	Site characterization	Closed project. Work performed in 1995.
Flightline Drive ⁹	\$ 37,000	\$ 37,000	Removal of contaminated tanks and soils.	Voluntary project since 1995.
Glendale Avenue Landfill ⁸	\$ 278,000	\$ 278,000	RI/FS and abatement of chromium source.	Inactive site. ADEQ estimated the costs. Work performed since 1993.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY AFTER JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Goodyear, City of ¹⁰	\$ 49,378	\$ 49,378	Municipal well sampling.	In the early 1990's, ADEQ provided matching funds for sampling of groundwater wells in the vicinity of the Phoenix-Goodyear Airport Superfund Site. This project is closed.
GW Silicones ⁶	\$ 740,000	\$ 740,000	Groundwater pump and treat.	Work performed since 1991. Participating party costs estimated by ADEQ.
Hassayampa Landfill ¹¹	\$ 12,000,000	\$ 9,000,000	Groundwater pump and treat and soil vapor extraction continues.	RI/FS began in 1988. Estimates by working parties. EPA has incurred substantial oversight costs.
Hexcel Chromium Disposal ⁷	\$ 520,000	\$ 130,000	RI/FS, chromium mitigation action, and cap design.	Beginning in the mid 1980's; with an estimated 25% of the work performed in or after 1991.
Honeywell, Peoria ⁶ (Peoria Ave. Facility)	\$ 1,900,000	\$ 1,140,000	RI/FS, Remedial action plan, and preliminary design.	Work began in the mid 1980's. An estimated 60% of work has been conducted in or after 1991.

SITE NAME	REMEDIAL ACTION COSTS PAID BY AIR FORCE PARTICIPATING COMPANIES	REMEDIAL ACTION COSTS PAID BY AIR FORCE PARTICIPATING COMPANIES	REMEDIAL ACTIONS COMPLETED	COMMENTS
Honeywell - Deer Valley Evap. Pond'	\$ 250,000	\$ 250,000	Investigation and closeout.	1996 voluntary Site.
Houston International ¹²	N/A	N/A	See Comments.	New project. This is a preliminary investigation.
Hughes AF Plant #44 ³	\$ 58,526,000		RI/FS and soil and groundwater remediation.	RI/FS started in 1981 and groundwater remediation began in mid 1980's. Costs for both soil and groundwater investigations and cleanups were provided by the Air Force. No estimate of work performed after 1991.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY AFTER JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Indian Bend Wash South ¹	\$ 2,250,000	\$ 2,250,000	Facility specific. Investigations--see comments.	Listed in 1990. 100% of the costs have been paid after January 1, 1991. EPA has spent a substantial amount of money on the RI/FS and on design and construction of the DCE Circuits SVE system for which ADEQ paid \$60,000 as part of its state match requirements. Past costs estimates provided by IMC Magnetix, Unitog, and Prestige.
Indian Bend Wash North ¹	\$ 45,000,000	\$ 29,250,000	RI/FS and soil and groundwater remediation.	RI/FS began in 1984 and Groundwater pump and treat since 1994. An estimated 65% of the costs have been paid in or after 1991. EPA has incurred substantial oversight costs.
Intel ⁶	\$ 765,000	\$ 765,000	Site characterization.	Since 1991. Cost estimates provided by Intel.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTY DATING FROM 1990	REMEDIAL ACTION COSTS PAID BY PARTY AFTER JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Kelly Electric ⁷	\$ 37,000	\$ 37,000	Investigation.	1996 Voluntary project. Future cleanup costs have been estimated by ADEQ.
Kingman Airport/ Mohave County ⁵	\$ 43,000	\$ 43,000	Site characterization and soil removal.	Early 1990's. Matching funds (\$43,000) were provided by ADEQ for investigations (estimated to be \$33,000) and removal of contaminated soils (estimated to be \$10,000). Total cost of project: \$86,000.
Los Reales Landfill ^{12 10}	\$500,000	\$ 500,000	RI/FS, remedial action plan and preliminary design.	Began in 1991. IGA between the City of Tucson and ADEQ (\$200,000).
Luke Air Force Base ¹¹	\$ 19,024,000		RI/FS soil removal, soil vapor extraction and on-site capping.	Work conducted under the FFA since 1990. No estimate for work conducted after January 1, 1991.
Martensen ⁷	\$300,000	\$ 300,000	Removal of contaminated soil.	1995 Closed voluntary site.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS COMPLETED	COMMENTS
Motorola 56th St. ⁶	\$ 6,750,000	\$ 6,075,000	RI/FS, pilot scale groundwater and soil vapor extraction.	Became a site in 1989. An estimated 90% of the project expenditures have been incurred in or after 1991. Participating party costs estimated by Motorola.
Mountain View Mobile Home Estates ¹	\$ 9,600,000		Site was capped. All residents were relocated. An on-site burial of mobile homes and physical structures completed the site closure.	Corps of Engineers performed the work since the mid 1980's.
19th Avenue Landfill ¹	\$ 22,500,000	\$ 18,400,000	RI/FS, engineered cap, gas mitigation system.	ADEQ lead NPL site. RI/FS completed in 1988. Final remedy initiated in 1995. \$18,400,000 has been spent after January 1, 1991.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY AFTER JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Nogales Wash ²	N/A	N/A	Groundwater investigations. WQARF installed several monitoring wells along the wash area.	Since 1987.
Northeast Mesa ²	N/A	N/A	Groundwater investigations. WQARF has conducted wellhead monitoring.	Since 1988.
Northwest Tempe ²	\$ 511,250	\$ 511,250	Groundwater investigations	This project was added to the WQARF Priority List in 1993. Past participating party costs estimated by ADEQ.
Old Marsh Aviation ³	\$8,000,000	\$ 8,000,000	Soil remediation.	Closed pesticide remediation project. ADEQ estimated costs paid by participating parties in 1992 & 1993.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTIONS COMPLETED	COMMENTS
162nd Air National Guard ²	\$6,600,000		RI/FS and groundwater treatment system design.	Since late 1980's. No estimate of costs paid after January 1, 1991.
Overland Trails ³	N/A	N/A	Investigations due to health complaints.	ADEQ conducted investigations due to health complaints in 1992 and 1993. Closed project.
O'Harr Auto Salvage ³	\$ 2,388,000	\$ 2,388,000	Soil remediation.	Work began in 1991. Closed Project. Estimate provided by Pima County.
Payson, Town of ³	N/A	N/A	RI/FS, soil removal, remedial design.	Since 1990. ADEQ designing interim pump and treat system.
Phoenix/Goodyear Airport-North ¹	\$ 9,000,000	\$ 6,750,000	RI/FS, soil vapor extraction, groundwater pump and treat.	RI/FS begin in 1984. Soil and groundwater cleanup since 1993. An estimated 75% of the costs have been paid in or after 1991. EPA spent \$1.5 million on the RI/FS. The participating party past costs were estimated by ADEQ in consultation with EPA.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY JANUARY 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Quality Printed Circuits ¹	N/A	N/A	Investigations due to health complaints.	Closed project. ADEQ conducted investigations due to health complaints from 1992 to 1994.
Quartzsite ¹²	N/A	N/A	Preliminary groundwater investigation paid by WQARF.	Began in 1995.
Ray Road ^{7,9}	\$ 525,000	\$ 525,000	Contaminated soil removal.	Closed voluntary site. Initiated in 1994.
Raymond Street ²	\$ 60,000	\$ 60,000	Preliminary investigations	Beginning in 1995. Participating party costs have been estimated by ADEQ.
Safford Airport ³	\$ 300,000	\$ 250,000	Contaminated soil investigation and removal.	Beginning in 1990. Costs estimated by ADEQ. ADEQ incurred costs include \$12,500 matching funds. The work has been completed.
Shiloh Baptist Church ⁷	\$ 6,300	\$ 6,300	Investigations, removal and closeout.	Voluntary project since 1995. Cleanup costs estimated by ADEQ

SITE NAME	REMEDIAL ACTION COSTS PAID BY ADEQ PARTICIPATING PARTIES	REMEDIAL ACTION COSTS PAID BY OTHER PARTICIPATING PARTIES	REMEDIAL ACTION COSTS COMPLETED	COMMENTS
Schultz Auto Shredder Fluff Dump ³	N/A	N/A	Removal of contaminated materials. Site restoration paid by WQARF.	Another auto shredder fluff removal action is needed for the west bank of the New River. Completed in 1995.
Silverbell Jail Annex Landfill ⁴	\$ 450,000	\$ 292,500	RI/FS and design of groundwater treatment system.	Initial work began in the late 1980's. An estimated 65% of the expenditures were incurred in or after 1991. Cleanup costs estimated by participating party. Pump and treat to begin in 1996.
16th Street & Camelback ⁵	\$ 335,000	\$ 250,000	See Comments	Work began in 1990. ADEQ is performing an investigation of the property with funding provided by private sources. The total amount given to ADEQ under a legal agreement is \$335,000. An additional \$64,000 could become available, subject to UST contingency

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS COMPLETED	COMMENTS
South Mesa ²	\$ 1,206,500	\$ 1,025,525	See comments. ADEQ's costs include investigations and soil vapor extraction.	This project was placed on the WQARF Priority List in 1987. An estimated 85% of the project costs have been incurred in or after 1991. Participating party costs are for installation of a groundwater well at Applied Metallica and SRP's well head treatment remedial action.
Star Container ⁷	\$ 4,900	\$ 4,900	Investigations and closeout.	ADEQ estimate. Voluntary project since 1996.
Three Points Airport ⁷	\$ 60,000	\$ 60,000	Investigations	1996 voluntary project. ADEQ estimated costs paid by participating party.
27th Avenue Landfill ⁶	\$ 3,100,000	\$ 2,600,000	RI/FS and remedial design	Early to mid 1990's.

SITE NAME	REMOVED ACTION COSTS PAID BY PARTICIPATING PARTY	REMOVED ACTION COSTS PAID BY PARTICIPATING PARTY	REMOVED ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS COMPLETED	COMMENTS
Tucson International Airport Area ¹ - soils	\$ 6,447,000	\$ 6,447,000	\$ 6,447,000	RI/FS and groundwater pump and treat.	Since 1989. 100% of the costs have ben spent in or after 1991. EPA has incurred substantial oversight costs. Estimates received from Tucson Airport Authority and Burr Brown.
Tucson Urban Study Area ¹²	N/A	N/A	N/A	WQARF conducted a preliminary investigation for the purpose of investigating cascading wells in the downtown Tucson area.	Began in 1995.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS COMPLETED	COMMENTS
Tucson Airport Remediation ²	\$ 8,500,000	\$ 5,950,000	RI/FS. Groundwater pump and treat.	Groundwater pump and treat since 1994. RI/FS began in the mid 1980's. 70% of the costs have been paid in or after 1991. EPA/ADEQ conducted RI/FS. \$2.7 million of these costs were reimbursed by the Respondents but are not reflected in this table. \$2.6 million WQARF costs represent matching funds for the TARP treatment plant.
Vestar Arizona XIII LCC ³	\$ 145,000	\$ 145,000	Investigation and removal.	1996 Voluntary site. Costs estimated by ADEQ.
Vulture Mill ¹²	N/A	N/A	ADEQ has conducted soil and groundwater sampling and blood testing.	Since 1992. ADEQ is performing an engineering evaluation and cost assessment to determine response strategy.
Waddell Dam ⁸	\$ 87,000	\$ 87,000	Removal of contaminated soils.	Early 1990's. Estimate provided by participating party.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PROPERTY OWNER	REMEDIAL ACTION COSTS PAID BY PROPERTY OWNER	REMEDIAL ACTION COSTS PAID BY PROPERTY OWNER	COMMENTS
West Central Phoenix ²	\$ 2,132,883	\$ 2,132,883	RI/FS, soil vapor extraction.	This project was placed on the WQARF Priority List in 1987. 100% of the costs have been paid in or after 1991. Money is in a special fund for cleanup (1.275 million plus \$700,000) from Nucor. United is doing a RI/FS with an estimated value of \$2.4 million and has agreed to pay a percentage of future costs thereafter. A pending settlement with Components and Corning is for \$750,000. Estimates provided by Univair/Van Waters and Rogers, May, Corning, Layke, Osborn Products, Vanguard, Sonee Heat and F & B. ADEQ estimated the costs of Rinchem.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING PARTY	REMEDIAL ACTION COSTS ESTIMATED BY PARTICIPATING PARTY AFTER JANUARY 1, 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
West Van Buren ²	\$ 5,764,000	\$ 5,187,600	RI/FS and soil vapor extraction.	This project was placed on the WQARF Priority List in 1987. An estimated 90% of the work has been conducted in or after 1991. Several parties performing onsite source control work. Past cost estimates provided by Reynolds Metals, Dolphin, Maricopa County, AT&T, Van Waters and Rogers, and ALSICO (per a recent letter). Chemresearch past costs were estimated by ADEQ.
Western Ave. PCE Plume ¹²	N/A	N/A	Groundwater investigations	Began in 1995. ADEQ preliminary investigation. It is too premature to estimate future costs.
Wickenburg Mill ⁶	\$ 22,000	N/A	Soil and drum removal.	1989-1990
Williams AFB ¹¹	\$ 31,000,000		RI/FS, groundwater pump and treat, soil removals.	Since 1984. No estimate of costs paid after January 1, 1991.

SITE NAME	REMEDIAL ACTION COSTS PAID BY PARTICIPATING SITES	REMEDIAL ACTION COSTS PAID BY NPL IN 1991	REMEDIAL ACTIONS COMPLETED	COMMENTS
Woody Mountain Well Field ¹⁰	\$ 238,000	N/A	Groundwater well monitoring. See comments.	Began in 1987. ADEQ provided \$238,000 in matching funds for this groundwater quality investigation project.
Wrecksperts ⁶	N/A	N/A	Contaminated soil removal.	1995 Closed project. ADEQ removal action.
Yuma Marine Corps Air Station ¹¹	\$ 19,412,000	N/A	RI/FS and soil removals.	Site was designated on the NPL in 1990. Costs estimated by Navy. No estimate of costs paid after January 1, 1991.

TOTALS	\$104,624,200	\$ 212,306,677		These totals are not all-inclusive. When information currently unknown about the various sites becomes available, the totals will increase.
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TOTAL AMOUNT SPENT BY PARTICIPATING PARTIES FOR REMEDIAL ACTION IN ARIZONA	\$ 404,624,202	
REMOVE DOD AND MILITARY NPL SITES	\$ 134,562,000	
TOTAL AMOUNT SPENT BY PARTICIPATING PARTIES FOR REMEDIAL ACTIONS AT NPL AND WQARF SITES		\$ 270,062,202
ADD AMOUNT RECEIVED BY ADEQ JANUARY, 1987 TO JUNE 30, 1996 FROM WQARF REVENUES FROM APPROPRIATIONS, FEES, INTEREST, AND PENALTIES	\$ 40,851,100	
TOTAL AMOUNT SPENT ON REMEDIAL ACTION BY PARTICIPATING PARTIES AND ADEQ AT NPL AND WQARF SITES FROM APPROXIMATELY JANUARY, 1983 TO JUNE 30, 1996		\$ 310,913,302
TOTAL AMOUNT SPENT ON REMEDIAL ACTION BY PARTICIPATING PARTIES AND ADEQ AT NPL AND WQARF SITES FROM JANUARY, 1987 TO JUNE 30, 1996	\$ 298,188,306	
DIVIDED BY 9.5 YEARS TO DETERMINE AMOUNT SPENT PER YEAR		\$ 31,388,243
TOTAL AMOUNT SPENT ON REMEDIAL ACTION BY PARTICIPATING PARTIES AT NPL AND WQARF SITES FROM JANUARY, 1987 TO DECEMBER 31, 1990	\$ 45,030,529	

TOTAL AMOUNT SPENT ON REMEDIAL ACTION
BY WQARF FROM JANUARY, 1987 TO
DECEMBER 31, 1990

\$ 10,769,450

TOTAL AMOUNT SPENT ON REMEDIAL ACTION
BY PARTICIPATING PARTIES AND
ADEQ AT NPL AND WQARF SITES FROM
JANUARY, 1987 TO DECEMBER 31, 1990

\$ 55,799,979

DIVIDED BY 4 YEARS TO DETERMINE AMOUNT
SPENT PER YEAR

\$ 13,949,995

TOTAL AMOUNT SPENT ON REMEDIAL ACTION
BY PARTICIPATING PARTIES AT NPL
AND WQARF SITES FROM JANUARY, 1991
TO JUNE 30, 1996

\$ 212,306,677

TOTAL AMOUNT SPENT ON REMEDIAL ACTION
BY WQARF FROM JANUARY, 1991 TO
JUNE 30, 1996

\$ 30,081,650

TOTAL AMOUNT SPENT ON REMEDIAL ACTION
BY PARTICIPATING PARTIES AND
ADEQ AT NPL AND WQARF SITES FROM
JANUARY, 1991 TO JUNE 30, 1996

\$ 242,388,327

DIVIDED BY 5.5 YEARS TO DETERMINE AMOUNT
SPENT PER YEAR

\$ 44,070,605

NOTE: Non-NPL Department of Defense Sites, Emergency Response costs, and water quality monitoring costs are
not included in this table.

1. National Priority List (NPL) Sites
2. Water Quality Assurance Revolving Fund (WQARF) Priority List Sites
3. Department of Defense (DoD) Sites
4. Inactive WQARF Priority List Sites
5. Closed WQARF Priority List Sites
6. Other WQARF Sites
7. Voluntary Site
8. Inactive - Other WQARF Sites
9. Closed Sites
10. Inter-Governmental Agreements (IGAs)
11. NPL Department of Defense Sites
12. Preliminary WQARF Investigations

Dated: October 2, 1996
Doc. 7979

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MEMORANDUM

TO: Members of the Groundwater Cleanup Task Force

FROM: David L. Wallis for the Arizona Chamber of Commerce

DATE: October 21, 1996

RE: ADEQ WQARF Cost Estimates

The Arizona Chamber of Commerce (the "Chamber") appreciates the efforts of the Arizona Department of Environmental Quality ("ADEQ") to estimate the costs associated with the WQARF liability reform proposals being considered by the Groundwater Cleanup Task Force (the "Task Force"). The Chamber believes that ADEQ's cost estimates are too high. Also, ADEQ's costs estimates do not accurately reflect the WQARF liability reform proposals.

ADEQ representatives have stated that the cost estimates were based in part on ADEQ assumptions and data provided by others. The Chamber requests that ADEQ describe all of the assumptions it used to generate the cost estimates. ADEQ also should identify the sources of the data used for the cost estimates. Upon review of ADEQ's assumptions and sources of data, the Chamber will provide a more detailed evaluation of ADEQ's cost estimates. For now, the Chamber provides the Task Force with the following preliminary evaluation.

1. **SITE BUDGETS**

The Site Budget cost estimates for both WQARF liability reform proposals fail to recognize the savings in remedial action costs that will result under the remedy selection and end use proposals adopted by the Task Force. For example, many of the budgets for individual WQARF sites assume a "pump and treat" remedy that may not be cost effective or technically feasible.

The cost estimates for both WQARF liability reform proposals also do not consider the site prioritization methodology approved by the Task Force, which may stagger many of the costs ADEQ projects for 1998 and 1999. Furthermore, site prioritization may indicate that some of the

WQARF sites for which ADEQ has estimated costs will not require any remedial action (or at least not to the degree projected by ADEQ).

ADEQ needs to reduce its cost estimates for the "source" liability proposal to account for costs associated with source investigations and remediations, which will not be paid from the WQARF. For example, the cost estimates include at least \$1.9 million in "source identification" costs in 1998 and \$1.2 million in 1999. The cost estimates also include costs for remediating vadose zone contamination, which again will not be paid from the WQARF. One of several examples of "source" remediation costs is ADEQ's projected \$1.6 million in 1998 to transport and dispose of mill tailings at the Vulture Mill site. This activity is "source" remediation and should not be included in the cost estimates. It also is unlikely that ADEQ has given any credit in its Site Budgets for costs associated with investigating and remediating "sources" in groundwater, which again will not be paid from the WQARF.

Although the Chamber has not verified the sources of ADEQ's data for its Site Budgets (primarily because most of those sources are unknown), ADEQ identified several sources that are inaccurate. For example, ADEQ's reports that the Pinal Creek Group has estimated that the final groundwater remedy will cost between \$95 million to \$420 million. Representatives of the Pinal Creek Group reported to the Task Force that the \$95/\$420 million figures are not a Pinal Creek Group estimate. These representatives have stated that an accurate estimate would be multiples lower than the \$420 million figure. The \$95/\$420 million figures account for \$5 million of the 1998 and \$13 million of the 1999 Site Budgets under the "source" liability proposal. A more accurate estimate will significantly reduce the Site Budgets for the "source" liability proposal.

The cost estimates for the "source" liability proposal also fail to recognize that a responsible party may perform non-source remedial actions. Private party remedial actions have, historically, proven to be more cost-effective than government-directed remedial actions.

The cost estimates for the "proportionate share" liability proposal for many of the non-landfill sites represents total remedial action costs for such sites. Most of these costs should be recoverable from responsible parties, except for orphan shares. For landfill sites, ADEQ assumed at 25% orphan share (which seems high based on past landfill liability allocations). ADEQ should reduce the Site Budgets for non-landfill sites to only orphan share liability (i.e., a reduction by 75% using ADEQ's estimated orphan share percentage for landfill sites).

2. POSITIONS AND P&O

The Positions and P&O cost estimates include "indirect" costs. As stated in the "source" liability proposal, indirect costs should be separately funded through a process that provides for appropriate legislative oversight or limitations. Thus, "indirect" costs should be removed from the cost estimates for the "source" liability proposal.

Under the "proportionate share" liability proposal, most of ADEQ's Positions and P&O costs should be recoverable from responsible parties, except for orphan shares. ADEQ should lower these estimates to account only for "orphan" share liability (e.g., reduce such costs by 75% using ADEQ's estimated orphan share percentage for landfill sites).

3. PASI AND EMERGENCY RESPONSE

As stated above, ADEQ included "source investigation" activities (e.g., PASI activities) in its Site Budgets. These costs are being duplicated as a separate item in the cost estimates. Duplicative costs should be eliminated from the cost estimates.

Under both WQARF reform proposals, ADEQ's PASI and emergency response costs should be recoverable from responsible parties, except for orphan shares under the "proportionate share" liability proposal. ADEQ should reduce these costs for the "source" liability proposal to account for "source" costs and should lower these estimates for the "proportionate share" liability proposal to account only for "orphan" share liability (e.g., reduce such costs by 75% using ADEQ's estimated orphan share percentage for landfill sites).

4. ATTORNEY GENERAL/LITIGATION/APPEALS

One of the undisputed advantages of the "source" liability proposal is that it will significantly reduce the "transactional costs" (e.g., attorney and litigation costs) associated with a joint liability or proportionate liability scheme. ADEQ's attorney general, litigation and appeal estimated costs for both WQARF liability reform proposals are very similar. These costs should be much lower under the "source" liability proposal.

5. ADWR/COMMUNITY INVOLVEMENT

ADEQ provided no documentation for the Arizona Department of Water Resources ("ADWR") estimated costs. It is uncertain whether the well inspection program (\$2.9 million) is a one-time cost or an annual cost. If it is an annual cost, it seems excessive.